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MINISTRY OF COMMERCE

REPORT OF THE INDIAN TARIFF BOARD

ON THE

MACHINE TOOLS INDUSTRY

1947

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REPORT ON THE MACHINE TOOLS INDUSTRY.

Application for protection and reference to the Board.

1. Several firms engaged in the manufacture of machine tools or their ancillary parts submitted applications to the Government of India for protection or assistance to their industry. The following statement gives the essential details of these applications :—

No.	Name of firm.	Date of Application.	Authority to whom the application was made.	Type of manufacture for which protection is required.
1	Messrs. Batala Engineering Co., Ltd., Batala.	26-6-45	Department of Commerce.	Machine tools.
2	Indian Sewing Machine Manufacturing Co., Ltd., Lahore.	2-1-46	Industrial Adviser, Department of Planning and Development.	Chucks.
3	Messrs. Kirloskar Bros., Ltd. Kirloskarwadi.	3-7-46	Department of Commerce.	Machine tools.
4	The All-India Manufacturers Organisation, Bombay.	July 46	Department of Commerce.	Machine tools.
5	Messrs. J. Chakravarty & Co. Calcutta.	5-4-46	Department of Commerce.	Guillotine knives.

The case of the machine tools industry was referred to the Board by the Government of India (Department of Commerce) in their Resolution No. 218-T(55)|45, dated the 13th July 1946.

Under the terms of reference which are stated in paragraph 5 of the Resolution No. 218-T(55)|45 of the Commerce Department, dated the 3rd November 1945, the Board has to report whether the industry satisfies the following conditions :—

"(1) that it is established and conducted on sound business lines ; and

(2) (a) that, having regard to the natural or economic advantages enjoyed by the industry and its actual or probable costs, it is likely within a reasonable time to develop sufficiently to be able to carry on successfully without protection or State assistance ; or

(b) that it is an industry to which it is desirable in the national interest to grant protection or assistance and that the probable cost of such protection or assistance to the community is not excessive.

Where a claim to protection or assistance is found to be established, *i.e.*, if condition (1) and condition (2) (a) or (b) are satisfied, the Board will recommend—

(i) whether, at what rate and in respect of what articles, or class or description of articles, a protective duty should be imposed ;

(ii) what additional or alternative measures should be taken to protect or assist the industry ; and

(iii) for what period, not exceeding three years, the tariff or other measures recommended should remain in force."

The Board was asked to "give due weight to the interests of the consumer in the light of the prevailing conditions and also consider how the recommendations affect industries using the articles in respect of which protection is to be granted."

Action taken by the Board.

2. The Board issued a press communique on 30th August 1946 requesting firms and persons, who desired their views to be considered by the Board, to submit their representations before 15th October 1946. The Board also issued a general questionnaire to known producers, importers, consumers and associations as well as all Provincial Governments and Chambers of Commerce. A list of the persons, firms and organisations to whom the questionnaire was issued is given in Appendix I. The following factories were visited by Members of the Board, while factories visited on behalf of the Board by its officers are shown in Appendix II :—

Name and address of the factory.	Name and designation of the Members.	Date visited.
1. Batala Engineering Co., Ltd., Batala (Punjab)	Dr. Nazir Ahmad, Member ..	24-12-46
2. Climax Engineering Co., Gujranwala (Punjab)	Dr. Nazir Ahmad, Member	28-12-46
3. Cooper Engineering Ltd., Satara Road.	Mr. C. C. Desai, Member—Secretary.	17-3-47
4. India Machinery Co., Ltd., Dassnagar (Howrah).	Dr. Nazir Ahmad, Member ..	9-3-47
5. Indian Sewing Machine Manufacturing Co., Ltd., Ferozpur Road, Lahore.	Dr. Nazir Ahmad, Member ..	27-2-46
6. Maya Engineering Works, 36A Russa Road, Calcutta.	Dr. Nazir Ahmad, Member ..	8-3-47
7. The Investa Machine Tools & Engineering Co., Ltd., Bombay.	Mr. C. C. Desai Member—Secretary.	..
8. Mysore Kirloskar, Ltd., Harihar (Mysore State)	Mr. C. C. Desai .. .. Member—Secretary. ..	18-3-47
9. P.S G. & Sons Charity Industrial Institute, Coimbatore.	President .. .. Mr. C. C. Desai	January 1947. 24-5-47
10. The Argus Engineering Works, Coimbatore	Mr. C. C. Desai	24-5-47

Cost accounting was done with respect to the production of machine tools at the factories of Messrs. Kirloskars Ltd., Cooper Engineering Works Ltd., and Investa Machine Tool and Engineering Co. Ltd. Oral evidence of the main producers, importers, consumers and others was taken at the office of the Board in Bombay on the 9th and 10th April 1947. Appendix III shows the names of firms, individuals or associations invited for oral evidence, while Appendix IV gives the names of those who actually attended the public inquiry.

Definition of machine tools and scope of inquiry.

3. Several definitions of machine tools have been offered from time to time. At the public inquiry the Board considered in particular two definitions—one offered by the National Machine Tools Builders of America and the other given in the Machine Tool Control Order (1941) which was followed for control purposes in India during World War II. After some discussion it was agreed that, in the context of the present Indian conditions, the definition given in the Machine Tool Control Order (1941)

should be accepted with the proviso that machine tools capable of working on glass should also be included in this definition, which would thus read as follows :—

> "Machine tool includes any mechanical contrivance for cutting, forming, abrading, polishing or otherwise working or treating wood, glass, metal, or plastic material such as bakelite, any standard equipment usually sold therewith and any machinery ancillary to the operation thereof."

Some objection was raised to the latter part of the definition relating to the ancillary machinery. But it was generally agreed that, for the present at least, the definition of machine tools should include ancillary equipment. Thus, according to this definition, machine tools cover an enormous variety of designs for both general and special purposes. There are numerous varieties of even the standard machine tools, such as the lathe, the shaper, the planer, the horizontal boring machine, the vertical drill, the press, the milling machine, etc., which give them more or less an individualistic character. Besides these standard machines, there is a wide range of machine tools designed for special purposes and all these fall within the scope of this inquiry. The ancillary parts, such as lathe chucks, guillotine knives, etc. would also be covered by this inquiry, but this inquiry does not extend to small tools for which a separate reference has been received by the Board.

History of the industry.

4. Although machine tools were manufactured in this country as early as 1890 and their manufacture continued throughout the early years of the twentieth century, the number of manufacturers was very small and their products were generally poor in quality and did not come up to the recognised standards. The manufacture of machine tools was mostly undertaken by factory and workshop owners to satisfy their own requirements and hardly any of their products found their way into the market. The machine tools produced during this period were heavy duty deep gap cone pulley lathes and deep throat drilling machines. The war of 1914-18 induced certain manufacturers in the Punjab to produce machines suitable for turning out shells. This continued during the war, and after 1919 there was a slight increase in the activity of these manufacturers. A few Indian engineering concerns even undertook the manufacture of girder milling and drilling machines, but the general quality of these machine tools was below the required standard, and few of the machines manufactured at that time entered the market. The earliest quality manufacturer in this line was the firm of Messrs. P. N. Dutt & Co. Ltd., Calcutta, which in 1930 commenced the manufacture of reasonably good quality machine tools. In 1935, Messrs. Cooper Engineering Ltd., Satara, which up till then were mainly engaged in general engineering, joined in the manufacture of quality machine tools. They were followed in 1937 by the India Machinery Co. Ltd., Calcutta. The total number of machine tools manufactured in India before World War II was estimated to be about one hundred per annum.

5. The outbreak of World War II entirely changed the complexion of the Indian machine tools industry. On account of the insignificant size of the Indian production, the country's requirements were mostly

met by imports from abroad. With the outbreak of war there was a perceptible fall in these imports as a consequence of which India was hard put to it for obtaining machine tools for her new industrial development, for replacement and for maintenance of her factories. The situation, however, was not very acute since imports, though reduced in numbers, still continued to come to India. However, with a view to promoting the development of the industry, the Government of India passed the Machine Tool Control Order in February 1941 (*vide* Appendix V) and appointed a Machine Tool Controller to make an inventory of machine tool production, regulate imports, improve the quality of local products and secure for the armed forces, ordnance factories and war industries the best quality machine tools. With these ends in view, a system of licensing was introduced by which licences were granted to producers of machine tools who had the necessary plant and technical supervision at their disposal. In the begining these licences were granted rather freely presumably with a view to creating a reasonable manufacturing capacity in the country before making attempts to rationalise and re-organise the industry on scientific lines. A number of firms obtained licences for manufacturing machine tools, and the Indian production, supplemented on a fair scale by imports from abroad, sufficed to a large extent to provide the country's requirements. The situation, however, took a sudden turn for the worse in the beginning of 1943 with the entry of Japan into the war and the closing of the Mediterranean route to shipping. India's reliance on imports to supplement her machine tool manufacturing capacity proved a serious bottleneck in equipping her industrial plants. Since the imports were largely cut off unless required for high priority war jobs, the Indian industry was called upon to make great efforts to fill the gap and supply the country's requirements. Schemes were put into force to regulate and control still more strictly the distribution of machine tools manufactured in the country. A number of engineering firms came forward to undertake the manufacture of quality machine tools in addition to those firms which were already engaged in this work. In order to develop and expand the Indian machine tools industry, Government took several measures through the Machine Tool Controller. The most important among them were as follows :—

(a) The import of machine tools into the country was strictly controlled and import licences were issued only for high priority jobs and for such machine tools as could not be manufactured in the country.

(b) The productive capacity of the leading manufacturing firms was extended by the supply of high quality machine tools required by them for balancing or expanding their production.

(c) Government agreed to purchase the entire production of these firms provided they came up to the required standards.

(d) The services of a team of seven technicians, having long experience in building machine tools, were obtained from U.K. to guide the Indian machine tool manufacturers in their work. These technicians stayed in India for about two years and a half and rendered valuable assistance in raising the quality of machine tools.

(e) Government offered the services of the Machine Tool (Inspection) Branch, comprising 17 gazetted officers, formerly of War and now of Industries and Supplies Department, to test and inspect the machine tools manufactured in the country, which were classified as Grades I, II and III and ungraded by charging an inspection fee of only 1 per cent. on the maximum statutory ceiling prices fixed by Government, and advised the machine tool manufacturers to make full use of this offer which also helped in upgrading the quality of their manufacture.

As a result of these steps taken by Government, the machine tools industry made good progress in India as will be seen from the fact that, whereas in 1942, the total number of machine tools manufactured in India was 316 of which 273 were graded, in 1946 this number had increased to 8,810 of which not less than 4,121 or nearly 50 per cent. were graded. The progress made by the Indian machine tools industry during the war years has been acknowledged by the United Kingdom Machine Tool Mission which came to India in 1944 in the following words :—

> "Machine tool industry in India has grown up during the war to meet the urgent need for machine tools. A few firms who had considerable experience of general engineering built a number of fairly heavy lathes, but generally the industry has endeavoured to meet the requirements of the small sizes of lathes, shaping machines, drilling machines, milling machines of a simple type and a few planing machines."

6. While the Indian machine tools industry has made this remarkable progress in a short period of time, it may be mentioned that the general organisation of the industry has not been a specialised one. This is probably due to the hurried manner in which the manufacture of machine tools was undertaken and expanded owing to the stress of World War II. Many firms which were previously engaged in manufacturing general engineering items took over the production of machine tools, but retained their other general engineering activities. However, there are distinct signs that the tendency to specialise in the manufacture of machine tools is gaining ground, and some of the wellknown manufacturers, e.g., Kirloskars, either have already switched over to the exclusive manufacture of machine tools or are contemplating to do so at an early date. This is a happy sign and the sooner this specialisation is accomplished, the better it would be for the industry as a whole. The organisation of the machine tools industry in the industrially advanced countries of the world owes its pre-eminence to these factors of rationalisation and specialisation ; and there is no denying the fact that for the most efficient production of machine tools in India, specialisation in plant laid out, designed and equipped for the production of machine tools only would be more economical and would materially help in building up this industry on sound lines.

Location of industry.

7. As stated in paragraph 5, licences for the manufacture of machine tools were granted freely in the beginning to encourage their manufacture in India and to supply the requirements (as far as possible) of the local market from indigenous manufacture. In 1945, the Machine Tool Controller reported that altogether 186 Indian firms then held manufacturing licences for

machine tools and ancillary equipment. He graded these manufacturers as follows :—

Class*	Plant and technical supervision—Poor	114
Class**	Poor plant—fair technical supervision or fair plant—poor technical supervision	42
Class ***	Poor plant—good technical supervision ; or good plant poor technical supervision	21
Class****	Fair plant—fair technical supervision ; good plant—fair technical supervision ; fair plant—good technical supervision.	4
Class*****	Good plant—good technical supervision	5
	Total	186

The distribution of these 186 firms in the different zones in 1945 is shown in the following table :

Zones.	Classification.					Total.
	*	**	***	****	*****	
North	90	27	8	2	..	127
East	12	7	6	1	3	30
South	5	4	1	..	2	12
West	7	4	5	1	..	17
	115	42	20	4	5	186

8. Since then there has been a regrading of the manufacturing firms on the basis of the grades of machines produced by them. According to the schedule of requirements which will be described later in para 18(e) machine tools are classified in three grades, while those machine tools which do not come up to even grade III and those for which no grading is necessary are known as 'ungraded'. At present the total number of manufacturers of graded machines is 22 as shown in Appendix VI, while the number of manufacturers of ungraded machines is not known. The distribution of the manufacturers of graded machines in the different parts of India is shown in the following table :—

	Grade I	Grade II	Grade III	Total
Bengal	4	3	1	8
Bombay	3	1	1	5
Mysore	1	..	..	1
Punjab	4	2	2	8
Total	12	6	4	22

9. It will thus be seen that whereas the manufacture of machine tools is fairly widespread, there is a heavy concentration of manufacturers of ungraded machines in the northern zone. In regard to the graded machines, it will be noticed that there are 8 firms in each of the two provinces of Bengal and the Punjab, 5 firms in Bombay and 1 in Mysore State. It is surmised that since the termination of the war, a number of manufacturers of ungraded machines have gone out of production as they were unable to stand competition, while a number of firms have succeeded in improving the quality of their machine tools and have thus moved from a lower to a higher grade.

Uses.

10. As will be seen from the definition in paragraph 3, machine tools are required for a very large variety of uses in factories, workshops and industrial concerns for maintenance and repair, building of machinery and parts and construction of machine tools. There are at least 150 operations in which machine tools are used. Some of these operations, namely, boring, cutting, planing, edging, scraping, etc., are relatively simple and the machines required for them are, therefore, simple in design and without elaborate gear boxes, equipment and accessories. Other operations such as die-casting, die-sinking, gear-generating, counterboring, thread-grinding, dove-tailing, etc., are relatively more complex and require machine tools of elaborate design and construction. Again some machine tools, which are generally required for maintenance and repair purposes need not be high precision machines ; while others, required especially for manufacturing machinery and equipment and in tool rooms have to conform to high standards of precision and durability. But the important point to remember is that, taken as a whole, the economic and industrial development of a country cannot possibly take place in the modern age without the help of machine tools. They, in fact, constitute the wheels which keep going the industrial activity of a country. Apart from their use in peace-time in maintaining and expanding such industries as the manufacture of locomotives, textile machinery, motor cars, elecrical equipment, radios and television sets, mining machinery, etc., machine tools are indispensable to a country in time of war as the manufacture of armaments, ships, aeroplanes and all other essential commodities necessary for the life and defence of a nation depends upon them. The industrially advanced countries such as England, U.S.A., U.S.S.R., pre-war Germany, etc., have long ago recognised the essential character of the machine tools industry and have established it on a strong and extensive basis. Today, any country without an organised machine tools industry is at a great disadvantage in times of both peace and war. It may, therefore, be emphatically stated that the machine tools industry is a key or basic industry which must be established on strong and efficient lines so as to meet the country's requirements.

Raw and semifinished materials.

11. The principal raw materials required for the machine tools industry are pig iron, rolled steel products and non-ferrous metals. The other consumable stores are coal, coke, limestone and timber. The following statement gives the full details of the raw and semifabricated materials used in the machine tools industry.

(a) *Raw material available from indigenous sources.*

1. Pig iron.
2. Steel and scrap.

3. Limestone.
4. Copper.
5. Tin—not produced in India.
6. Zinc—not produced in India.
7. Aluminium.
8. Lead.
9. Antimony.
10. Dismuth.
11. Coal and coke.
12. Timber.
13. Foundry sand.

(b) *Semi-fabricated stores which have to be imported.*

1. Bright drawn mild steel sections.
2. Black rolled & precision ground high carbon and alloy steel sections.
3. Ball and roller bearings.
4. Bright machined nuts, bolts, washers, studs and set screws.
5. Special lubricating accessories.
6. Plastic.
7. Specialised electrical gear.
8. 'V' belts.
9. Roller and toothed chains and sprockets.

It will be seen that practically all the heavy raw materials required by the industry are locally available. Even high speed steels, which were imported in the past, are now being manufactured in India. The quantities of the semi-fabricated stores such as ball and roller bearings, plastic materials, etc., required by the industry are small ; and, given the necessary facilities, there should be no difficulty in obtaining them. The quantities of the principal raw materials, viz., pig iron and steel, are dependent upon the number and size of the machine tools, the latter ranging from a few pounds to many thousand pounds per unit. However, it has been estimated that the annual requirements of pig iron are approximately 10,000 tons, while the annual requirements of steel are 4,000 tons. In spite of the fact that these quantities are not large, the manufacturers of machine tools unanimously represented at the public inquiry that they were experiencing considerable difficulty in obtaining their supplies of these raw materials and consumable stores, especially pig iron, coal and coke. Similar difficulty has been experienced by the factories in shipping their finished goods to the consuming centres which has resulted in unnecessary hardship on the consumers and the blocking of large amounts of working capital. Pig iron constitutes the most important raw material, and several of the manufacturers stated that they have encountered such difficulties in obtaining adequate supplies that they were often on the point of closing down their factories. In this connection it was brought to the notice of the Board that in the past large quantities of pig iron have been allowed to be exported out of India. We are informed that in the years 1942-43, 1943-44, 1944-45 and 1945-46 respectively 521,000 tons, 242,000 tons, 186,000 tons and 154,000 tons of pig iron, making a total of 1,103,000 tons, were exported out of India to U.K., under a contract between the Government of India and H.M.G., and that the export price of pig iron ranged between Rs. 51 and Rs. 53 per ton as against inland prices ranging between Rs. 65 and

Rs. 70 per ton of iron of comparable quality. Whatever reasons may have prevailed during these years for the export of such large quantities of pig iron at prices lower than those charged to the Indian manufacturers, we are definitely of the opinion that the needs of the Indian industry should be given preference and that the export of this important raw material should be allowed only after India's industrial needs are satisfied. In particular, in view of the importance of the machine tools industry, we are of the opinion that larger quotas for pig iron, steel, coke and coal should be allowed to the machine tool manufacturers than in the past and that they should be accorded a high priority in transporting these materials to their factories and in shipping their finished goods from the factories to the consuming centres.

Consumption in pre-war and war years.

12. As stated in paragraph 4, the production of machine tools in India prior to 1939 was insignificant, not exceeding 100 machines per annum. The country's requirements were, therefore, met almost entirely from imports from abroad, chief exporting countries being the U.K., U.S.A., Germany, Switzerland and Japan. However, in view of the fact that machine tools are not shown separately in the Customs Schedule or the Seaborne Trade Statistics, but are lumped together with other machinery and its parts, it was not possible to get the exact details of machine tools of various types imported from abroad in the pre-war years. The Director General of Industries and Supplies gave the estimate that, on an average, the value of machine tools annually imported into India was about Rs. 2 crores, and this estimate was generally regarded as being correct by those who attended the public inquiry.

13. As mentioned in paragraph 5, a system of issuing licences for imports was instituted in 1941, which has been in operation since then. As a result, more complete information in regard to import of machine tools is available since 1941. Appendix VII gives full details of 23 groups of machine tools and ancillary equipment for which licences were issued in 1941, 1942, 1945 and 1946. The position of imports may be summed up in the following table :—

	1941 (Nov-Dec.)		1942		1945 (Mar-Dec.)		1946	
	U. K.	U.S.A.	U. K.	U.S.A.	U. K.	U.S.A.	U. K.	U.S.A.
Machinetools ..	407	828	923	..	3,454	385	6,341	643
Chucks ..	16	62	1,247	..	2,956	12	8,918	1,309
Total	423	890	2,170	..	6,410	397	15,259	1,952

According to the Machine Tool Controller, the value of machine tools for which import licences were issued since 1943 is as follows :—

	Rs.
1943	65,03,000
1944	3,27,58,000
1945	3,04,67,000
1946	5,64,50,386

He estimated that the value of machine tools for which import licences would be issued in 1947 would be about Rs. 8 crores. These figures are self explanatory and give a fair idea of the magnitude of the Indian requirements as well as the scope for expansion of the industry if it is adequately established in the country.

14. We have seen in paragraph 10 that machine tools find numerous uses in the industrial life of a country, and it may be instructive, at this stage, to examine the principal industries in which machine tools have been employed during the last few years. Fortunately, statistics relating to the consumption of 19 types of machine tools by 24 different industries are available from 1st January 1943 to 5th June 1945, and are given in Appendix VIII. These relate to machine tools indented both from abroad and from local manufacturers. It will be seen that during this period, out of a total of 22,445 machine tools indented for use in India, no less than 11,300 were required for Government departments and utility services, while the remainder were taken up by various industries.

Future demand.

15. In regard to the future demand, it was pointed out at the public inquiry that in basing the demand on the prewar figures the following factors should be taken into account :—

(a) The price of machine tools in manufacturing countries has gone up very considerably, ranging from 50 per cent. to 200 per cent. for the different categories of machine tools. On an average, an increase of 100 per cent. on the same type of machine tools as manufactured in the pre-war years may be assumed.

(b) The manufacturing countries, especially U.S.A. and U.K., have been experimenting with new and improved types of machine tools which are more elaborate, and consequently more expensive than those manufactured by them in the pre-war years. Therefore, as a result of this improvement in the type of machines, a further increase in price may be assumed. It is difficult to estimate the percentage of increase in price on this account.

(c) During war years, there has been a considerable lacuna in the supply of machine tools, as a result of which there is a large pent-up demand in the country. In addition to this pent-up demand, many new industries are expected to be developed in the course of the next three years, and all these would require machine tools of different types. As a result of the pent-up demand as well as the development of new industries, it should be assumed that the demand for machine tools in the post-war years will be at least double of that in the pre-war years.

Taking all these factors into account, it is estimated that machine tools worth over Rs. 9 crores per annum would be required by India during the next three years.

Domestic production and productive capacity.

16. We have seen in paragraph 15 that the requirements of machine tools in India during the next few years are estimated to be worth over Rs. 9 crores per annum. We may now consider briefly the actual production of machine tools in India during the last few years as well as the productive capacity of the machinery installed for their manufacture. The details of

annual production between 1942 and 1946 have been kindly supplied by the Machine Tool Controller and are shown in Appendix IX. The position may be summarised as follows :—

Average per annum of 5 years from 1942 *to* 1946.

Description		No. of machines	Value in Rs.
Grades I, II and III	..	2,594	75 lakhs
Ungraded	..	2,978	30 lakhs
	Total ..	5,572	105 lakhs

The values given above are at controlled prices, and the figures for production and value include those for chucks. These figures represent the averages for 5 years from 1942 to 1946, but since the production of machine tools was increasing rapidly from year to year, the figures for 1946 would be more illustrative. These are as follows :—

Domestic production in 1946.

Description		No. of machines	Value in Rs.
Grade I	..	3,578	72 lakhs
Grade II	..	380	12 lakhs
Grade III	..	163	30 lakhs
Ungraded	..	4,689	60 lakhs.
	Total ..	8,810	174 lakhs

Note.—The figures for Grade I also contain the figures for 1,480 chucks valued at Rs. 4 lakhs. Therefore, the number and value of Grade I machine tools exclusive of chucks would be :—

No. of machines ..	2,098
Value ..	Rs. 68 lakhs.

Thus the value of the total production of all machine tools in India in 1946 was Rs. 174 lakhs of which Rs. 114 lakhs represent the value of graded machine tools.

17. It will be seen from the above that according to the figures of production for 1946, the machinery installed in India for the manufacture of machine tools is capable of producing graded machine tools worth at least Rs. 114 lakhs. This estimate is based on factories working on a single shift. It was stated by the manufacturers at the public inquiry that their factories were not able to work up to their full capacity for want of raw materials, coke and coal and on account of labour troubles. They were of the opinion that, with the present equipment, the production could be increased immediately by 25 per cent. They were further of the opinion that by progressive addition of supplementary equipment, especially of the balancing plant required by them, the manufacturing capacity could be increased by at least 100 per cent. provided that raw materials, coke and coal are available and that labour conditions were satisfactory. This higher production will not only represent an increase in the number of machine tools of the types at present manufactured by them but also of the improved types. Thus, the total productive capacity installed in the country, consequent upon the addition of balancing

plant and dependent upon the supply of raw materials, etc.. may be estimated to be sufficient to produce machine tools worth Rs. 2 crores per annum during the next three years.. Many of the firms have already placed orders for the balancing plants which they expect to receive in the near future.

Quality.

18. It will be seen from paragraph 16 that the Indian machine tools industry has made remarkable progress during war-time. At the outbreak of the war in 1939, the total number of machine tools manufactured in India did not exceed 100 per annum, while in 1946 this had risen to 8,810 of which 3,578 were classed as Grade I, 380 as Grade II and 163 as Grade III. It was, however, agreed at the public inquiry that there was considerable room for further improvement both in quantity and in quality, especially in the manufacture of new types and models. The manufacturers assured the Board that they were straining every nerve to bring about these improvements, which are indicated under the following heads :—

(a) *Appearance and finish.*—During the war, many materials such as paints and varnishes, which play an important part in giving good appearance and finish to machine tools, were not available. This difficulty, however, is not likely to exist any more ; and the manufacturers were confident that they would be able to market their products which would be equal in appearance and finish to the imported types.

(b) *Style.*—It was pointed out by the consumers that the imported machines often had a more attractive style. The manufacturers assured us that they would concentrate on new designs which would be as attractive in style as the imported ones.

(c) *Raw materials.*—During the war, most of the raw materials required by the machine tools industry were controlled, and the industry had to resort to such make-shift raw materials as they were able to obtain. Also, some special types of alloy steels required by them were not easily available. These difficulties are now expected to disappear. The manufacturers were confident that if they are provided with suitable raw materials, they would have no difficulty in manufacturing the right type and quality of machine tools. It was mentioned that many of the defects noticed in the Indian machine tools were of metallurgical nature, but it was expected that the Indian iron and steel industry, which has made a noteworthy progress during the last 30 years, would be able to supply iron, steel and alloy steels free from these metallurgical defects. Some special types of steel, which are required in small quantities, may still have to be imported, as it may not be economical for the Indian iron and steel manufacturers to manufacture and market them at competitive prices. The establishment of the National Metallurgical Laboratory would also be helpful in detecting metallurgical defects in the raw materials and suggesting ways and means of avoiding them in future. It was also mentioned in this connection that specifications for raw materials are available with most of the manufacturing firms, and they have been assured that there would be no difficulty on the part of the Indian iron and steel manufacturers to supply materials in accordance with these specifications.

(d) *Treatment of raw materials.*—A point was made at the public inquiry that even if the raw materials of the correct specifications are made available, they require special treatments, such as the heat treatment, to develop the right properties. During the war, some of the firms did not possess adequate facilities for these treatments. They have, however, placed orders for the necessary equipment, and they expect to have them installed in the near future. In this connection, it was suggested that it might be more economical and efficient to set up a central organisation for heat treatment and gear cutting which would cater for the needs of the industry as a whole. The industry promised to examine this point. In this connection, it was mentioned that some firms have surplus capacity for heat treatment and gear cutting in excess of their own needs which would be available to those firms which did not at present possess these facilities. It is suggested that this fact should be brought to the notice of the industry so that firms, which do not possess these facilities at present, might take full advantage of the surplus facilities possessed by others.

(e) *Tolerances.*—It was generally agreed that the Indian machine tools industry has made good progress in manufacturing machines which satisfy the limits of tolerances as laid down by the Machine Tool Controller. The grading of machine tools was based on the alignment test charts prepared by the Machine Tool Controller. The limits of tolerances for Grade I machine tools were determined by taking into consideration the geometrical accuracy of 4 or 5 products of the leading U.K. manufacturers as well as—Dr. Schlesinger's standard limits, and taking the average figures. Grade II limits were framed for machine tools requiring wider limits by increasing Grade I limits by 50 per cent. Grade III limits were framed for machine tools which needed still coarser limits of accuracy by increasing the Grade I limits by another 150 per cent. The number of machine tools which come up to the Grade I standard has progressively increased as will be seen from Appendix IX, and the well-equipped firms should be able to manufacture all their products according to these standards. It was agreed that for the present production, the types of machine tools built to Grade I accuracy should conform to Dr. Schlesinger's standard limits, but that in view of the increasing demand for high precision machine tools, the industry should make every effort to produce machine tools with even narrower tolerances. It was stressed that first class manufacturers should concentrate on the production of Grade I machines, leaving the production of machines with lower tolerances, which may be required by sundry consumers, to other manufacturers who are unable to come up to those standards. In this connection, it was pointed out that while some of the firms have the proper testing equipment to ensure that the machines are made according to these tolerances, others do not possess a complete range of testing equipment. It is suggested that it would be very desirable for all the Grade I manufacturers at least to have the necessary equipment for carrying out these tests, particularly the hardness tests for which the results on the Indian machine tools have not been as satisfactory as for the other tolerances. Furthermore, for special kinds of tests, the facilities which will be offered by the National

Metallurgical and Physical Laboratories should be fully utilised by the industry. In this connection, the manufacturers stated that although they were willing to purchase the necessary testing equipment and to set up testing laboratories in their factories, at present they have to pay a high duty on this equipment which amounts to 30 per cent. *ad valorem.* Since this high duty is a tax on knowledge and stands in the way of the industry becoming research-minded, we recommend that the duty on testing equipment required by the machine tools industry should be refunded or remitted. Furthermore, in order that the industry should be in a position to take full advantage of the research and testing facilities which would be offered by the National Metallurgical and Physical Laboratories, we suggest that each first class firm should have a Liaison Officer whose business should be to take the problems of the industry to these Laboratories and to bring home to the factory the results of research carried out at these centres.

(*f*) *Performance tests.*—It was pointed out by several consumers that although machine tools may conform to Grade I specifications initially, their performance after some time may not be as satisfactory as that of the imported machines. It was contended by the manufacturers that this defect may be due to lack of proper maintenance on the part of the consumers or to the poorer quality of the materials which the industry had been forced to use during war. With the assurance of supply of the right type of materials, it is expected that the performance of the Indian machine tools would not be inferior to that of the imported machine tools. It was also mentioned that in many cases the Indian machine tools were found to be suitable for light work, but were not equally suitable for heavy work. The manufacturers promised to look into this matter, and to include in their new designs the manufacture of such machine tools as would be suitable both for light and for heavy work.

Inspection.

19. The Board is given to understand that under the Machine Tool Control, a system of inspection has already been in operation for some time past. Inspectors are appointed to go round from factory to factory to inspect machine tools manufactured therein and to grade them according to the specifications of Grade I, Grade II or Grade III. Machines which do not fall in any of these three grades are termed 'ungraded machines'. Charts have been drawn up for each type of machine giving tolerances for each of the three grades, and the machines are classified according to these charts. After a machine is inspected by an Inspector, it is stamped by him with dies which are kept in his safe custody, and a certificate of inspection is issued which gives full details of tolerances and the grade in which the machine has been classified. The Board is of the opinion that this system of inspection should not only be continued for the period of protection, but that it should be further strengthened. Adequate staff should be provided so that all the firms manufacturing machine tools can avail themselves of this service and have their machines inspected and passed by Government Inspectors. This provision is necessary not only to maintain the quality of the machine tools made in India, but also to assess the rate of development of the industry, since as a result of continual inspection, it will be possible to know from year to year how many

machines of each grade as well as ungraded machines are being manufactured in the country. The combined efforts of Government and the manufacturers should be concentrated on raising the quality of the indigenous machine tools. From this point of view inspection will be very useful as it will be helpful in upgrading the local products. Furthermore, this system of inspection will be indispensable to Government and public utility organisations, who will be expected to purchase their requirements from the local sources provided that machine tools answering to their schedule of requirements are made in the country. In addition, this system of inspection will also help in building up confidence of the public in the industry, as the private consumers will be free to ask for a certificate of inspection, and it will be compulsory upon the manufacturing firms to produce this certificate of inspection from a Government Inspector. It is, of course, understood that the ultimate responsibility for the performance of the machine tools will rest upon the manufacturers and not upon the Government Inspectors, but the inspection of the machine tools by an impartial staff and the issue of certificates showing the details of geometrical tests will go a long way in building up confidence in the local industry and in improving the quality of its machine tools. These services should be rendered to the industry free of charge, Government bearing all the expenditure involved in maintaining the inspection staff as part of its efforts to ensure the development of this industry along sound lines.

Maintenance of statistics of imports and production.

20. The machine tools industry in India is yet in the initial stages of development, and although very good progress has been made during the war years, much greater progress will have to be made before India becomes self-sufficient in the matter of machine tools. It is, therefore, desirable that statistical information should be available in regard to the types and quantities of machine tools which are imported into the country from year to year as well as the types and quantities of machine tools which are manufactured in the country. At present machine tools are lumped together under one or two heads in the statistics of Sea-Borne Trade, but these heads are not adequate in giving the required information. Machine tools, of course, cover a very wide range, and it is not possible to make a detailed classification. It is, however, possible to make a broad classification, which will be useful in obtaining the required information as to the number, types and quantities of machine tools imported and manufactured in the country. For this purpose a broad classification for machine tools has been prepared, and we recommend that in future this classification should be adopted for the Accounts of Seaborne Trade of India as well as for the production statistics maintained by the Machine Tool Controller. The proposed classification is as under :—

(1) Lathes.
(2) Drilling machines.
(3) Shaping machines.
(4) Planing machines.
(5) Milling machines.
(6) Band-sawing machines.
(7) Circular sawing machines.
(8) Presses.
(9) Chucks.
(10) All others.

Existing rate of customs duty.

21. Machine tools are not entered separately at present in the tariff schedule. but are included in machinery and its parts under items 72(b) and (c) and 72(3) and are subject to a revenue duty of 10 per cent. *ad valorem*. The following is the relevant extract from the Customs Schedule :

Item No.	Name of article.	Nature of duty	Standard rate.	Preferential rate if the article is the produce or manufacture of The U.K.	Preferential rate if the article is the produce or manufacture of A British Colony.	Preferential rate if the article is the produce or manufacture of Burma.
	SECTION XVI.					
	Machinery and aparatus : Electrical material.					
72	Machinery, namely, such of the following articles as are not otherwise specified—					
	* * * * * * *					
	(*b*) Machines and sets of machines to be worked by electric, steam, water, fire or other power, not being manual or animal labour , or which before being brought into use require to be fixed with reference to other moving parts	Revenue	10% *ad valorem*	..	..	Free
	(c) Apparatus and appliances, not to be operated by manual or animal labour, which are designed for use in an industrial system as parts indispensable for its operation and have been given for that purpose some special shape or quality which would not be essential for their use for any other purpose ..	Revenue	10% *ad valorem*	..	..	Free
	* * * * * * *					
72(3)	Component parts of machinery as defined in Items Nos. 72, 72 (1) and 72 (2), namely, such parts only as are essential for the working of the machine or apparatus and have been given for that purpose some special shape or quality which would not be essential for their use for any other purpose ..	Revenue	10% *ad valorem.*	..	..	Free
	Provided that articles which do not satisfy this condition shall also be deemed to be component parts of the machine to which they belong if they are essential to its operation and are imported with it in such quantities as may appear to the Collector of Customs to be reasonable.					

System of import control and price fixation during wartime.

22. During the war when Government undertook several active measures, as detailed in paragraph 5, for fostering this industry in India, it was decided that the Machine Tool Controller should be authorised to fix the ceiling prices of the different types of machine tools manufactured in the country, and that in fixing these statutory ceiling prices,

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10 per cent. was allowed on the actual cost of production. During the war period payment against bulk orders placed by Government was effected on the basis of statutory ceiling prices. Soon after the war ended, the position of imports became easier, and to safeguard the interests of the indigenous industry, urgent measures were taken by Government to restrict the imports of machine tools equivalent to Grade 1 standard to the extent not manufactured in the country. Further, the Machine Tool Controller, while implementing the import restrictions, allowed a margin up to 25 per cent. in favour of indigenous products, i.e., he rejected an import application if he found that the difference between the estimated landed cost and the price of the indigenous product of a corresponding quality was of the order of twenty-five per cent. or less. This practice has been in force since then and, therefore, the machine tool manufacturers have *virtually* been enjoying a protection of approximately 35 per-cent. *ad valorem*.

Comparison of c.i.f. prices with manufacturers' costs of Indian machine tools.

23. As usual the Board had asked the Collectors of Customs and a large number of importing firms to furnish details regarding the c.i.f. prices of imported machine tools. While this information was furnished by the Collectors of Customs, only some of the importers complied with the request. Other importers expressed their inability to give detailed prices of imported machine tools. The Collector of Customs, Calcutta, reported that importers in his area were reluctant to give this information as they were afraid that it might be used to their disadvantage by the Tariff Board. The Cost Accounts Officers deputed by the Board had investigated the cost of manufacture of lathes, drilling machines, and planing machines at three factories as mentioned in paragraph 2, and these costs were also before the Board. They showed a certain amount of variation owing to differences in labour charges, electric costs, general efficiency, etc., but in most cases the costs were not mutually comparable owing to the differences in the types and sizes of the machines made at the different factories. An attempt was made to compare the factory costs of Indian machine tools with the c.i.f. prices of the imported articles as shown in Appendix X, but it was found that such a comparison was neither helpful nor even possible for two reasons. In the first place, machine tool is a generic term which covers a very wide range of articles so that one machine tool may differ from another in one or more details. This difference may be in regard to minor details or it may be in regard to a major change in design or ancillary parts. But, as a result of these differences in design or details, which give an individualistic character to each machine tool, it becomes extremely difficult to compare the prices of two machine tools. For example, a lathe, which is one of the commonest machine tools, may be of several hundred types, each type differing from the other not only in its design and construction but also in regard to the presence or absence of certain ancillary parts which may greatly influence its price. In the second place, new types of machine tools are being continuously evolved not only in India but also in the foreign countries, and, therefore, there is no stability in the price of any particular item, such as lathe, drilling machine, shaping machine, planing machine, etc. In the course of the inspection of cost data of the Indian factories, our Cost Accounts Officer found that, in several cases, factories which had been

producing a certain type of machine tool, for which cost data were available, had recently decided to discontinue its manufacture and to build a new type for which cost data were not ready. The same feature prevailed in respect of imported machine tools for which it was reported that many of the types which had been exported to India in the previous years were to be discontinued, while the prices of the new types were not available. In addition to these two difficulties, there was the third difficulty mentioned above, namely, the reluctance on the part of certain importers to part with correct information regarding the prices of the machine tools imported by them under the apprehension that it might be used to their disadvantage by the Tariff Board. The first two difficulties are inherent in this case and are of a very special nature ; but the third difficulty could be overcome if the Tariff Board is invested with statutory powers to compel manufacturers as well as importers to allow their books to be examined by officers of the Board as and when required for the purpose of their inquiries.

Eligibility for protection.

24. From what has been stated in the earlier part of this report, especially in paragraphs 5 and 10, it is clear that India cannot hope to build up its industries in time of peace and effectively undertake its defence in time of war without the existence of a well established machine tools industry. Most of the raw materials required by this industry are available in the country, and whether or not the industry would be in a position to dispense with protection in course of time, its existence and future development are necessary in the vital interests of the country. In fact, in view of the special position which this industry occupies not only in the general industrial set-up of the country but also in its relationship to problems of defence which in the present context India must now face, it can be said to fall under condition 2(b) of the terms of reference to the Board, which relates to those industries to which it is desirable in the national interest to grant protection or assistance. This industry must, therefore, not only be protected but also fostered by the State as being of paramount national importance. While admitting the necessity for protection, we must not, at the same time, ignore certain salient features which have an important bearing on this question. We must, in the first place, take into account the fact that, at present and for some years to come, the productive capacity of the Indian machine tools industry will be adequate to supply only a part of her requirements and that it would be necessary to import a fairly large number of machine tools from abroad, especially of the more elaborate and recent designs. Any policy, therefore, which results in our industries being starved of machine tools required by them or being called upon to work with machine tools, which are relatively inefficient and therefore uneconomic, would, even though resulting in the protection of the machine tools industry, hamper the general industrial development of the country. In the second place, we have to bear in mind the fact that machine tools are an integral, and in some cases fairly expensive, part of the set-up of most industries, and, therefore, any protection granted to the machine tools industry should not unduly increase the cost of machine tools to our numerous consuming industries, which would be reflected in the cost of consumer goods produced in the country, and would, thereby, set in motion a vicious spiral of rising tariff duties. We should also bear in mind the fact that it has been our general principle not to recommend any high duties on capital

goods. In fact, in almost all of our previous reports dealing with other industries, we have recommended refund of duties paid by the various industries on the capital goods required by them for replacement or expansion. In this particular case, the question of imposing protective duties on such types of machine tools as are produced in the country is further complicated by the fact that each machine tool has an individualistic character, and since there is an enormous variety of machine tools, it becomes extremely difficult to compare the factory costs of manufacture with the cost of importation.

The difficulties and conflicting considerations which we have encountered with in this particular industry have also been experienced by other countries seeking adequate protection to their machine tools industry. We may as an illustration quote a certain relevant extract from the Australian Tariff Board report dealing with the Die-heads dated 14th March, 1946, which runs as follows :—

> " The question of protection of local manufacture of productive machinery, and especially of machine tools, has always been one of the most difficult to come before the Board, since Australian national interests involve conflicting considerations. On the one hand, the absence of a comprehensive machine manufacturing industry in Australia at the outbreak of war constituted one of the most serious obstacles in the way of rapid conversion of Australian production to war requirements. In fact it proved necessary to develop machinery manufacture regardless of cost, and on that basis remarkable results were achieved. There are, therefore, strong arguments for preserving the industry in the post-war era.
>
> " On the other hand must be set the interests of the community in machine using industries. Machine tools are used to manufacture productive machines and wearing parts for these, and the cost of such machines and parts depends heavily upon the cost and efficiency of the machine tool and of the appliances used with them. Costs of productive machinery are in turn reflected in the cost of their products and final consumer's goods often involve lengthy chains of processes each using machinery. The first link in this chain is the machine tool and the appliances used with it, and additions to cost at that stage are multiplied before the final products reach the consumer. The effect of even small protective duty on machine tools may thus have a disproportionately large effect on the cost structure of Australian industry, and on the cost of living in this country. The counter argument is thus also very strong, that Australian industry should have access at minimum cost to the most up-to-date machines produced anywhere in the world."

In view of all these conflicting considerations, it is clear to us that any scheme of protection which may be devised for this particular industry should be such as to harmonise the interests of the machine tool producers with those of the secondary industries using machine tools and that the main source of assistance to the machine tools industry must come from Government who should not only give adequate protection to the industry but should take active steps to foster and develop it in the national interest.

25 After taking all the above-mentioned factors into consideration, we are satisfied that the machine tools industry has justified its claim for protection. The industry should, therefore, be protected by the levy of protective in place of revenue duties, such duties remaining in force till March 31, 1950. As regards the quantum of protection which would be necessary during the next few years, it has not been possible for us, for reasons explained in paragraph 22, to determine it, as is our normal practice, on the basis of comparison of c.i.f. prices with the factory costs of production. In this connection, however, we have to be guided by the fact that during the war and since, the local machine tools industry has enjoyed quantitative restriction of imports except where the difference between the estimated landed cost and the price of a comparable indigenous machine tool exceeded 25 per cent., amounting for all practical purposes to a protection of round-about 35 per cent. (vide paragraph 22). Since the termination of the war, there has been a general tendency for the prices of raw materials and labour charges to go up, thereby raising the cost of production of finished goods including machine tools. In view, however, of the desirability of making machine tools available to the consuming industries at as low a price as possible, consistent with the paramount necessity of giving effective protection to the industry, we consider that for the initial period an additional duty of 15 per cent. should meet the needs of the case. The industry has agreed to this suggestion and has given an assurance that with the increased production which may be expected as a result of protection to the industry, it will make further efforts to reduce its prices, and that, in any case, it will not inflate the existing selling prices, taking advantage of the additional customs duty. We, therefore, recommend that a protective duty of 25 per cent. *ad valorem* should be imposed on all machine tools imported into India subject to the exceptions mentioned later in paragraph 29. This rate of 25 per cent. *ad valorem* should remain in force for one year from the date on which these recommendations are put into effect ; and before the expiry of this period a review should be made to determine whether a lower or higher measure of protection would be necessary during the remaining period of protection. We also recommend that during this period of one year the Machine Tool Controller should collect, as far as possible, information regarding the c.i.f. prices of imported machine tools of those categories which are at present manufactured in India. We further recommend that the Indian manufacturers should adopt such system of cost accounting in their factories as would enable our Cost Accounts Officer to ascertain with a fair degree of accuracy the actual cost of production. This is all the more necessary as most producers manufacture other items besides machine tools. If the accounts are all kept together it is not easy to ascertain the exact cost of manufacture of the particular machine tool as distinct from other items. If these two recommendations are carried out, we are sure that more detailed and exact information would be available during this period both as regards the factory cost of machine tools as well as the c.i.f. prices of imported products.

Rate of protective duty.

26. If during this period any attempts are made by the exporting countries to dump their products in the Indian market to the detriment of the local industry, the situation will have to be reviewed. In view of

the large variety of machine tools made in the country and our consequent inability to indicate the fair selling prices for the Indian manufacturer, it is not possible to invoke the automatic application of section 4(1) of the Indian Tariff Act under such circumstances. We, however, suggest that the machine tools industry should carefully watch the position, and if any attempt is made by importers to undersell indigenous machine tools, the matter should be brought to the notice of the Government preferably through the Association of Machine Tool Manufacturers. The Government, on such representation, should take immediate action, and, after such summary examination as may be necessary, readjust the duty under section 4(1) of the Indian Tariff Act.

27. The protective duty of 25 per cent. *ad valorem* which we have recommended for the initial period reduces very considerably the level of protection which machine tools industry has enjoyed so far. We have done so as we are anxious that the consuming industries should be in a position to obtain their supplies of machine tools at as low a price as possible consistent with the grant of adequate protection to the Indian industry. We may, in this connection, mention that in Australia where protection of the machine tools industry has been regarded as necessary, the duties on machines and machinery are as follows :—

British Preferential Tariff	45%
Intermediate Tariff	55%
General Tariff	60%

It will thus be seen that a duty of 25 per cent. recommended by us is considerably less than even the British Preferential Tariff on machine tools in Australia. It is true that in that country a provision is made whereby no duty is charged on those categories of machine tools which are not manufactured in the country ; whereas we have recommended, for reasons given in paragraph 27, that in the case of such categories no more than a protective duty of 10 per cent. *ad valorem* should be collected.

Quantitative control of imports.

28. While the protective duty of 25 per cent. *ad valorem* should, in our opinion, be sufficient to equalise in general the prices of the Indian products with those of the foreign machine tools, and should, therefore, place the Indian producers on terms of equality, so far as prices are concerned, with the importers, we are convinced that this measure by itself would not be enough to protect, much less to foster the Indian industry. The machine tools industry in India is of very recent growth, and has to compete with the highly developed machine tools industries of the Western countries, which have been in existence for nearly a hundred years. Our producers suffer from several disadvantages, such as, limited demand, higher costs of semi-finished materials, lack of experience and experts, etc., as compared with the foreign manufacturers. Furthermore, the prejudice against the local products is so strong that the Indian consumers would be inclined to purchase foreign machine tools even though the latter may be offered at a somewhat higher price. We may also add here that the existence of prejudice and the necessity of taking it into account in giving protection to the machine tools industry has been recognised by

other countries as will be seen from the following extract from a report of the Australian Tariff Board dated 14th March, 1946 :—

> " The United Kingdom product has, over a long period of years, built up such a solid reputation and become so well-known that, in order to sell its products, the Australian manufacturer will require a price margin of £2 to £3 each in its favour until the Australian made die-head becomes firmly established in this country ".

In order, therefore, to protect the Indian industry effectively, it would be necessary to have quantitative control on imports as well during the initial period. As mentioned by us earlier in the report, such import control has been exercised during the war years, and we feel that its continuance during the next few years is absolutely essential. We, therefore, recommend that import control on a quantitative basis should continue, and that licences for imports should be issued only in those cases where machine tools are not manufactured in India or where the Indian manufacturers are unable to supply the full demand. This quantitative control on the import of machine tools should continue up to 31st March 1950. The quantitative control recommended by us should be exercised strictly so as to minimise evasions through production of fictitious or unreasonably low figures of estimated landed cost or requests for permission to import more machine tools than could possibly be supplied by the Indian industry in the hope of obtaining import licences. It is not possible for us to devise a procedure which would avoid such contingencies, but we draw the attention of Government to the possibility of the adoption of these devices with a view to circumventing the import control in respect of machine tools. While licences should be freely granted for the import of the category of machine tools not manufactured in India, in the case of the categories manufactured in India, licences should be issued only if the Machine Tool Controller is satisfied that the machine tools for which import licences are asked are either not available or cannot be made available within a reasonable time to meet the requirements of the consumer. The burden of proving that the machine tool manufactured in India is not available to the consumer should not be laid on the importer. It will be the duty of the Machine Tool Controller to satisfy himself that there is a justification for the grant of a licence. Care should be taken that importers and consumers are not put to inconvenience by delay in the grant of licences. The Machine Tool Controller should have full and up to date information regarding the availability of machine tools manufactured in India and the probable dates of delivery. On the basis of this information he should either grant the licence almost immediately or direct the applicant to a specified Indian manufacturer who would be in a position to supply the machine tool in question.

Partial remission of duty on machine tools not manufactured in India

29. In view of the fact that India will have to import a fairly large number of machine tools of more complex and recent designs from abroad for some years to come, we are of the opinion that every facility should be given to our industries to import such machine tools as are not manufactured in the country. Further, the burden of the cost of such machine tools should rest as lightly as possible upon the Indian consumers so that the cost of their finished products may be kept down. In view of these reasons, we recommend that in the case of those machine tools which are not manufactured in India, which, we are told, would constitute nearly three-fourths of the total imports, remission of 15 per cent. should be

allowed so that the duty charged on such machine tools is no more than the existing 10 per cent. *ad valorem.* We wish to make it clear that it is not our intention that at first a duty of 25 per cent. should be collected from the importers and subsequently a refund or rebate of 15 per cent. should be allowed to them. This would involve unnecessary outlay of capital and hardship to the importers. Our intention, on the other hand, is that the Machine Tool Controller should definitely state on the application received by him that the particular type of machine tool required by the importer is not manufactured in the country, and, on this statement, the customs authorities should collect duty at the rate of 10 per cent. *ad valorem.* We are informed that it will not be difficult to operate such a scheme of partial remission of duty so long as import control continues. Four copies of the import application are submitted to the Machine Tool Controller for issue of import licences. These applications give full particulars of size, specification, price, etc., of the machine tools to be imported. We suggest that this practice should continue during the period of protection, and that on receipt of an application, the Machine Tool Controller should decide whether or not a machine tool required by the importer is manufactured in the country. If he is satisfied that the machine tool required by the importer is not manufactured in the country, he should endorse accordingly on the application and forward it to the Customs authorities so that duty at the rate of 10 per cent. *ad valorem* is collected on it. Furthermore, in such cases where machine tools required by the Indian consumers are not made in the country, import licences should be freely given by the Machine Tool Controller. We understand that out of a total anticipated import of machine tools worth about Rs. 8 crores per annum, the categories which are not manufactured in the country for which import licences would, under our scheme, be granted subject to a duty of only 10 per cent. *ad valorem* are estimated to be worth about Rs. 6 crores per annum. We considered the question whether the effective protective duty of 10 per cent. on machine tools not manufactured in India could be further reduced or remitted altogether with a view to giving relief to the consumers of such machine tools. We have, however, come to the conclusion that in the present state of this industry, it would be necessary to retain a protective duty of at least 10 per cent. even on those types of machine tools which are not manufactured in the country notwithstanding the fact that the retention of this duty may involve a somewhat higher initial outlay on certain class of capital goods required for industrial development. If the duty on machine tools which are not manufactured in the country is reduced below 10 per cent., it would offer a strong temptation to the Indian consumers to use slightly different foreign machine tools which they would be able to get at a lower duty and, therefore, at a cheaper price. It is true that this tendency will manifest itself in the case of certain classes of machine tools which are not yet manufactured in India but which can be used for purposes for which the Indian machine tools may be suitable, i.e., in the border line cases, but in view of the strong position and the highly developed nature of the foreign industry and also in view of the positive liking for the foreign machine tools, we feel that the Indian industry would be hit severely if the protective duty is reduced below 10 per cent. in case of any machine tools. We have made this recommendation notwithstanding the view taken by us in most of our previous reports that the duty on capital goods should be remitted, as we feel that the case of machine tools industry stands in a class by itself and that machine tools can, in most cases, be distinguished from manufacturing machinery. In this connection, we may mention the fact that the machine tool manufacturers themselves are large consumers of machine tools, and that they have offered no objection to the imposition of 10 per cent. duty even on those categories which are not manufactured in India.

Other forms of asistance to the industry.

30. The continuance of import control and the imposition of protective duty at a higher rate as suggested by us will in our opinion be sufficient measures to protect the industry during the initial period. We have, however, stated above that in view of the basic nature of this industry, it is not merely enough to protect it but that Government should take active measures to foster it so that the industry is able to meet the major portion of India's requirement in as short a time as possible. In order to achieve this object, it would be necessary for Government to take certain measures as suggested by us below, which would involve extra expenditure for the purpose of developing this industry. This expenditure can well be met from the revenue accruing from the higher duty recommended by us. We understand that even in the case of those types of machine tools which are now being manufactured in the country, the Indian production would be able to meet only about one-third of India's total requirements, and that machine tools worth about Rs. 2 crores per annum of these types will have to be imported from abroad. If this expectation is realised, it would mean an additional revenue of about Rs. 28 lakhs per annum from the higher duty imposed upon those categories of machine tools which are manufactured in the country. We suggest that a part of this additional revenue should be spent by Government for fostering and developing this industry as suggested below.

Cost of jigs tools, and fixtures.

31. One of the main items of expenditure in the manufacture of machine tools is the cost of jigs, tools and fixtures, especially for the new-types which are proposed to be manufactured in India. The cost of these jigs, tools and fixtures imposes a heavy initial outlay which some of the factories are unable to meet out of their own financial resources and is, therefore, a factor hampering progress. The expenditure on these items really pertains to developmental research, as these ancillary parts are required for building new machines, which may prove highly successful or which may have to be scrapped after further trials. Furthermore, some of the machine tool manufacturers require balancing plants in order not only to increase their production but also to improve the quality of their products. They also require special equipment such as furnaces for giving heat treatment, etc., which would make their products more durable. We recommend that Government should create a special fund for the development of the machine tools industry and make an annual non-lapsable contribution of Rs. 10 lakhs to this fund. The authority entrusted with the administration of this fund should make such grants to the manufacturers of graded machine tools as it thinks are reasonable for this special purpose. The Machine Tool Controller should be closely associated with the authority in the administration of this fund. The same authority should satisfy itself that any grants which are made from this fund are spent for improving the quality of the products by the manufacture of jigs, tools

and fixtures, purchase of balancing plant, training of personnel, etc., and are not utilised as a part of the general revenue of the factory. Grants from this fund should be made by the authority concerned, after consultation with the Advisory Committee, the establishment of which is recommended by us later in this report.

Specialists for the industry.

32. We stated in paragraph 5 that during the war a team of British experts was brought out from England to advise the industry, to guide it in the manufacture of new and improved type of machines and to raise the quality of their products. We are assured that this measure proved extremely helpful to the industry. We are of the opinion that the need for such expert advice is even more today as the industry has to make a great deal of progress before the country can become self-sufficient in regard to machine tools, and one of the principal drawbacks from which the industry is suffering is the absence of a sufficient number of first-class technicians. Speedy development of the machine tools industry on a sound footing largely depends on the technical advice and guidance of high calibre specialists serving the country. We, therefore, recommend that Government should take early steps to import high calibre specialists with least possible delay, so that substantial progress may be made during the protection period. These specialists may be brought out from U.K., Germany, Japan and U.S.A., and that they should be allocated to the different factories, especially those producing high-grade products, to enable them to embark upon the manufacture of new designs and to raise the quality of their products. Owing to the man-power shortage in the United Kingdom, it may not be possible to get many specialists from that country, but on the other hand, owing to the present living conditions in Germany and Japan, it may be possible that technicians belonging to these countries may find it convenient and attractive to come to this country and find suitable employment. If circumstances preclude procurement of specialists from Germany and Japan, it may be possible to get the right type of men from U.S.A.

Rate of depreciation.

33. The machine tool manufacturers unanimously represented to us that the present rate of depreciation allowed to them by the income-tax authorities was not adequate. We are informed that, in making precision machine tools, the machines wear out more rapidly, and it is desirable that their replacement should be more frequent so that products of high grades may be manufactured by the industry. We understand that the machine tool manufacturers in the United Kingdom are allowed depreciation at a special rate, which fact might be verified by Government. We recommend that the Central Board of Revenue should examine sympathetically the request of the industry to be permitted to write down depreciation at a higher rate than is the case at present.

Government patronage

34. Government and quasi-Government bodies are consumers of large quantities of machine tools as will be seen from Appendix VIII. It has also been mentioned before that in dealing with applications for import licences, including Government requirements, the practice was not to allow import unless the difference between the estimated landed cost of the proposed import and the cost of production of a similer article by an Indian producer

was of the order of 25 per cent. or less. We recommend that one of the most effective ways in which Government can render assistance to this industry is that all purchases of machine tools made by Railways and all Government and quasi-Government departments should be restricted to Indian-made goods as far as possible.

Advisory Committee.

35. In view of the national importance of the machine tools industry, we have made several recommendations for its development. It is essential that representatives of the industry should be closely associated in all the steps taken for the building up of the industry. The administration of the fund that we have recommended is a matter in which the industry is vitally interested. With a view to enlisting the co-operation of all the interests concerned in the machine tools industry, we recommend that an Advisory Committee consisting of representatives of manufacturers, importers and main consumers should be constituted and closely associated with the Machine Tool Controller and the authority which will administer the special fund. This Committee should also be associated with the various forms of machine tool control recommended by us in the report.

Burden on consumers.

36. In view of the large variety of uses to which machine tools are put and the numerous industries in which they are used, it was not possible for us to estimate, with any degree of accuracy, the extra burden which would be imposed upon the consumers if our proposal to increase the duty on machine tools from 10 per cent. to 25 per cent., except in the case of those machine tools which are not manufactured in the country, is accepted by Government. Almost all the manufacturing industries are users of machine tools to a large or small extent, but whereas in some industries the expenditure on machine tools is fairly heavy, in others it is quite small and is restricted to the cost of machine tools required in the workshop for maintenance and repairs. After making a general examination of the question, we are satisfied that the burden on the consuming industries as a result of an increase in duty from 10 per cent. to 25 per cent. in the case of those machine tools which are manufactured in the country will not be excessive, and that these industries should be in a position to bear this small extra burden in the interest of developing an important national industry on which they may have to depend largely in time of emergency. We must also in this connection mention that for the reasons which have already been explained by us fully in paragraph 24 the machine tools industry stands in a class by itself and must be regarded as a key industry, the establishment of which is necessary in the vital interests of the country. If, in pursuance of this end, a small extra burden has to be imposed upon the consumers, it will have to be borne for the sake of establishing this industry on a scale which would be sufficient to meet the country's requirements. We are assured by the producers that, if protection is granted to them, they would be in a position to increase their production by 100 per cent. from the present figure of tools worth about Rs. 1 crore to about Rs. 2 crores in the next few years. With the increase in production, the costs of manufacture are bound to come down, but whether or not the industry is in a position to dispense with protection at the end of the period of protection as suggested by us, it will have to be protected in the national interests until it is able to stand on its legs.

Chucks.

37. Chucks are an important ancillary equipment of several machine tools, such as, lathes and drilling machines, and have been defined by us as part of machine tools in paragraph 3. As one of the producers of chucks had applied for protection, it was our intention to examine the case of chucks in greater detail. Unfortunately, neither of the two main producers of chucks was able to attend the inquiry, and they requested the Board to postpone the inquiry in view of the communal troubles prevailing in their areas. It was not possible for us to comply with this request. In any case, the cost of production of machine tools in general, including chucks, will come up for review at the end of one year as stated in paragraph 25. We, therefore, recommend that the scheme of protection which we have recommended for machine tools in general should apply to chucks also. In other words, there would be quantitative control of imports and the collection of only 10 per cent. duty in the case of types and sizes of chucks which are not manufactured in India. We understand that, as in the case of machine tools, certain types and sizes of chucks are not at present manufactured in India and will have to be imported.

Conclusions and recommendations.

38. Our conclusions and recommendations are summarised as under :—

(1) The definition of machine tool, as given in the Machine Tool Control Order (1941), is adopted for the purpose of this inquiry with slight modification (para. 3).

(2) The total number of machine tools made in India before 1939 is estimated to be about 100 per annum (para. 4).

(3) The last war and the steps taken by Government gave a tremendous fillip to the machine tools industry, and the number of machine tools manufactured in India rose in 1946 to 8,810 of which 4,120 were graded (para. 5).

(4) While the manufacture of machine tools in the country is fairly widespread, there is a heavy concentration of manufacturers of ungraded machine tools in the Northern Zone (para. 9).

(5) Any country in the world without an organised machine tools industry is at a great disadvantage in times of peace and war, and it should, therefore, be regarded as a basic industry which must be established on strong and efficient lines (para. 10).

(6) Practically all the raw materials required by the industry are available in the country (para. 11).

(7) Exports of pig iron should be allowed only after India's industrial needs are satisfied (para. 11).

(8) Larger quotas for pig iron, steel, coke and coal should be allowed to machine tool manufacturers, and they should be given a high priority in transporting these materials to their factories and shipping their finished goods to consuming centres (para. 11).

(9) The value of machine tools annually imported into India in the pre-war years was about Rs. 2 crores (para. 12).

(10) During the period 1st January 1943 to 5th June 1943, a total of 22,445 machine tools were indented for the country out of which Government Departments and utility services took 11,300 while the remainder were taken up by various industries. (para. 14).

(11) The value of the machine tools which will be required by the country during the next 3 years is estimated at over Rs. 9 crores per annum (para. 15).

(12) The machinery installed at present in the country can produce graded machine tools worth about Rs. 1.40 crores. It can be increased to produce graded machine tools worth about Rs. 2 crores by the addition of balancing plant (para. 17).

(13) The quality of the machine tools made in the country is, on the whole, satisfactory. Improvements are desirable in several directions and there is no reason why the industry, given due facilities, should not be able to effect these improvements (para. 18).

(14) The industry should examine the question of setting up a central organisation for heat treatment and gear cutting, and in the meantime factories which do not possess these facilities should take advantage of the surplus capacity of other factories [para. 18(d)].

(15) The industry should make every effort to produce precision machine tools with even closer limits of accuracy than those laid down at present for grade I [para. 18 (e)].

(16) The duty on the testing equipment required by the machine tools industry should be refunded or remitted [para 18(e)].

(17) Each first class factory should have a Liaison Officer to correlate its work with the researches which will be carried out at the National Metallurgical and Physical Laboratories [para. 18(e)].

(18) The present system of inspection should not only be continued but further strengthened to enable the consumers to obtain certificates of inspection and this service should be rendered free of charge to the industry (para. 19).

(19) A new classification of machine tools is suggested for the Accounts of Sea Borne Trade of India (para. 20).

(20) Owing to the wide range and individualistic character of machine tools it is not possible to compare the c.i.f. prices of imported machine tools with the Indian factory costs of production (para. 23).

(21) In view of the special position which this industry occupies not only in the general industrial set-up of the country but also in its relationship to problems of defence it must be regarded as a key industry to which it is desirable in the national interest to grant protection and assistance. The industry must, therefore, not only be protected but also actively fostered by the State (para. 24).

(22) The industry should be protected upto 31st March 1950. A protective duty of 25 per cent. *ad valorem* should be imposed on all machine tools imported into India subject to certain exceptions mentioned in para. 29. This rate of duty should remain in force for one year from the date on which these recommendations are put into effect. During this period of one year, the Machine Tool Controller should collect, as far as possible, information regarding c.i.f. prices of those qualities which are at present manufactured in India. The Indian machine tool manufacturers should adopt such a system of cost accounting in their factory as would enable the Board's Cost Accounts Officer to ascertain, with a fair degree of accuracy, the actual cost of production (para. 25).

(23) If during the period of protection any attempts are made by exporting countries to dump their products in the Indian market to the detriment of the local industry, a review should be made and the protective duty should be adjusted accordingly (para. 26).

(24) Import control of machine tools on a quantitative basis should continue upto 31st March 1950. Licences for imports should be issued only in those cases where machine tools are not manufactured in India or where the Indian manufacturers are unable to supply the full demand within a reasonable period of time. This quantitative control should be exercised rigidly so as to minimise evasion (para. 28).

(25) In the case of those machine tools which are not manufactured in India, remission of 15 per cent. duty should be made, thereby reducing the effective duty to the present level of 10 per cent. *ad valorem.* The Machine Tool Controller should satisfy himself whether or not a machine tool for which import licence is required is manufactured in India and where the machine tool is not manufactured in the country import licence should be given without delay (para. 29).

(26) Government should create a special fund for the development of the machine tools industry and make an annual nonlapsable contribution of Rs. 10 lakhs to this fund. The authority entrusted with the administration of this fund should make such grants to the manufacturers of graded machine tools as it thinks are reasonable. The Machine Tool Controller and the Advisory Committee should be closely associated with the authority in the administration of this fund (para. 31).

(27) Government should take early steps to import high calibre specialists with the least possible delay, and they should be allocated to different machine tool manufacturers to render them technical advice and guidance (para. 32).

(28) The Central Board of Revenue should examine sympathetically the request of the industry to be permitted to write down depreciation at a higher rate than is the case at present (para. 33).

(29) All Government and quasi-Government purchases of machine tools should be restricted to the Indian-made goods as far as possible (para. 34).

(30) An Advisory Committee consisting of representatives of manufacturers, importers and main consumers should be constituted to be in close touch with the various schemes of development and control (para. 35).

(31) We are satisfied that the burden on the consuming industries as a result of our recommendations will not be excessive. With the expected increase in production, consequent on protection, the cost of manufacture is bound to go down but whether or not the industry would be in a position to dispense with protection after 31st March 1950, it will have to be protected in the national interests until it is able to stand on its legs. (para. 36).

(32) Chucks are an important ancillary part of machine tools and are covered by the definition. Therefore, the scheme of protection devised for machine tools should apply to chucks. (para. 37).

Acknowledgments.

39. We would like to place on record our appreciation of the help given by Mr. S. S. Iyengar, Machine Tool Controller who supplied much useful information and assisted us in the public inquiry. Our thanks are also due to our Technical Adviser, Mr. R. N. Kapur and our Cost Accounts Officer, Mr. Raghava Rao for compiling technical and cost data, and to Mr. Ahmadullah and Rai Saheb Aggarwal, for the assistance rendered by them in the course of this inquiry.

SHANMUKHAM CHETTY,
President.

C. C. DESAI,
Member.

NAZIR AHMAD,
Member.

M. AHMADULLAH,
Secretary.

(CAMP) OOTACAMUND,
The 14*th June,* **1947.**

सत्यमेव जयते

APPENDIX I.

List of firms or individuals to whom questionnaire was issued.

Producers :

*1. Atlas Works Ltd., 119, Rippon Street, Calcutta.
*2. The Batala Engineering Co. Ltd., Batala (Punjab).
*3. Cooper Engineering Ltd., Satara Road, Satara.
*4. Dutt, P. N. & Co. Ltd., 3-A, Rajakali Kissen Lane, Calcutta.
*5. Hind Machine Ltd., 164, Jogendranath Mukherji Road, Salkia, Howrah.
*6. The India Machinery Co. Ltd., Dassnagar (Howrah).
*7. Investa Machine Tools & Engineering Co. Ltd., Clerk Road, Pais Street, Bombay.
*8. The Mysore Kirloskar Ltd., Harihar (Mysore State).
*9. Maya Engineering Works, 36-A, Russa Road, Calcutta.
*10. Sind Engineering Works, Shikarpur, Sind.
*11. Shyam Iron Works, Sind Canal Road, Shikarpur, Sind.
*12. Indian Sewing Machine Manufacturing Co. Ltd., 210, Ferozepore Road, Lahore.
*13. The Indian Tool Manufacturers Ltd., 250, Worli, Bombay.
14. Alfound Suppliers, Motinagar, Lucknow.
15. Bharat Tool Manufacturing Co. Ltd., Mathurdas Mills Compound, Lower Parel, Bombay.
16. Britannia Engineering Co. Ltd., Titaghur.
17. Burn & Co. Ltd., Howrah.
18. Chakravarty J. & Co., 34, Canal East Road, Calcutta.
19. The Climax Engineering Co., Gujranwala (Punjab).
20. Dayanand Technical Institute, Lahore.
21. Dandekar Machine Works G. G. Ltd., Bhiwandi.
22. Gangaram Hariram, Sir, Lahore Cantonment.
23. Indian Standard Metal Co. Ltd., Chinchpokly Cross Lane, Bombay.
24. Indian Machine Tool Manufacturing Co. Ltd., A-3, Clive Street, Calcutta.
25. Indian Engineers Corporation Ltd., Amritsar (Punjab).
26. Jay Engineering Works Ltd., 183-A, Prince Anwar Shah Road, Calcutta.
27. Jessop & Co. Ltd., Dum Dum (Bengal).
28. Kadia & Sons, Purulia (B. N. Railway).
29. Keymer Bragshaw & Co. Ltd., 22, Strand Road. Calcutta.
30. Machine Tool Manufacturing Co. Ltd., Lillooah, Howrah.
31. Modern Machine Limited, Moghalpura, Lahore.
32. Machinery Tool Manufacturers, Shahdara, Delhi.
33. The Oriental Engineering Works Ltd., Lahore.
34. Praga Tools Corporation Ltd., 7, Bausilapet, Secunderabad.
35. Paul's Engineering Works, 77|1|1, Clive Street, Calcutta.
36. P. S. G. & Sons Charity Industrial Institute, Coimbatore.
37. The 'Perfect' Machinery Works, 7, Brandreth Road, Lahore.
38. Practical Engineering Co. Ltd., Bombay.

Producers (contd.)

39. Richardson & Cruddas, Byculla Iron Works, Bombay.
40. Thompson & Co. T. E. Ltd., 9, Esplanade East, Calcutta.
41. Unique Engineering Works, Gujranwala (Punjab).
42. United Iron & Steel Corporation Ltd., Belur (E. I. Railway).
43. Victor Crane & Co. Ltd., Sialkot City (Punjab).

Importers :

*1. Alfred Herbert (India) Ltd., 19, Strand Road, Calcutta.
*2. Associated British Machine Tool Makers, 6, Old Post Office Street, Calcutta.
*3. Dodge & Seymour (India) Ltd., Laxmi Building, Ballard Estate, Bombay.
*4. Francis Klein & Company, 1, Royal Exchange Place, Calcutta.
*5. Machine Tools (India) Ltd., Stephen House, Dalhousie Square, Calcutta.
*6. William Jacks & Co. Ltd., 10, Clive Street, Calcutta.
7. Bird & Co. Ltd., Chartered Bank Building, Calcutta.
8. Bharat Tools & Appliances, Calcutta.
9. Begg Sutherland & Co. Ltd., Cawnpore.
10. Eastern Electrical Co. Ltd., Coimbatore.
11. Iqbal & Company, Mohammadally Road, Bombay.
12. Eruch D. Engineer & Co., Crossley House, Apollo Street, Bombay.
13. Gramophone Company Limited, 33, Jessore Road, Dum Dum.
14. Heatly & Gresham Limited, 4, Mission Row Extension, Calcutta.
15. Industrial Syndicate Ltd., 119-B, Rippon Street, Calcutta.
16. Jayems Engineering Company, Warden House, Sir Pherozshah Mehta Road, Fort, Bombay.
17. Kumardhubi Engineering Works Ltd., Chartered Bank Building, Calcutta.
18. Marshall Sons & Co. (India) Ltd., Marshall Building, Fort, Bombay.
19. Modi & Modi, 11, Linghi Chetty Street, Madras.
20. Marketing Corporation of India Ltd., Connaught Circus, New Delhi.
21. Nagarmall S., 8, Royal Exchange Place, Calcutta.
22. Shyam Iron Works, Shikarpur, Sind.
23. Volkart Brothers, Graham Road, Ballard Estate, Bombay.

Consumers :

*1. The Ahmadi Shipyard, Gun Carriage Basin, Colaba, Bombay.
*2. B. E. S. & T. Co. Ltd., Electric House, Bombay.
*3. Bombay Port Trust, Ballard Estate, Bombay.
*4. Director of Ordnance Factories, Calcutta.
*5. Jessop & Co. Limited, Dum Dum (Calcutta).
*6. Kaycee Industries Limited, The Mall, Lahore.
*7. Mazagon Dock Limited, Mackinnon Mackenzie Building, Ballard Estate, Bombay.
*8. The Tata Iron & Steel Co. Ltd., Bombay House, Bruce Street, Bombay.
*9. Gramophone Co. Ltd., 33, Jessore Road, Dum Dum.
10. Alcock Ashdown & Co. Ltd., 16, Bank Street, Bombay.

Consumers (contd.)

11. Alfred Herbert (India) Ltd., 13|3, Strand Road, Calcutta.
12. Begg, Sutherland & Co. Ltd., Cawnpore.
13. Bombay Steam Navigation Co. Ltd., Scindia House, Bombay.
14. Captain Superintendent, H.M.I. Dockyard, Bombay.
15. Dhanjishah B. Cooper, Sir, Huntworth, Satara.
16. Director of Industries & Commerce, Travancore State, Trivandrum.
17. Eastern Electrical Co. Ltd., Coimbatore.
18. Grand Iron Works, Chawri Bazar, Delhi.
19. Hooghly Dock & Engg. Works Ltd., Calcutta.
20. Indian Iron & Steel Co. Ltd., 12, Mission Row, Calcutta.
21. Jas Alexandar & Co. Ltd., Calcutta.
22. Jayems Engineering Co., Sir Pherozshah Mehta Road, Fort, Bombay.
23. Kirloskar Brothers Limited, Kirloskarwadi District, Satara.
24. Nagpur Glass Works, Limited, Nagpur City.
25. Nagarmal S. Esq., 8, Royal Exchange Place, Calcutta.
26. Director, Railway Board, New Delhi.
27. Shri Jaya Chamarajendra Occupational Institute, Bangalore.
28. Scindia Steam Navigation Company, Scindia House, Bombay.
29. Shyam Iron Works, Shikarpur (Sind).
30. Textile Machinery Corporation Ltd., Belghurriah (Calcutta).
31. Volkart Brothers, Graham Road, Ballard Estate, Bombay.

Associations :

*1. Engineering Association of India, 102-A, Clive Street, Calcutta.
*2. The Indian Machine Tool Manufacturers' Association, Ewart House, Bruce Street, Bombay.
*3. Machine Tool Traders' Association of Great Britain, Post Box No. 2050, Calcutta.
4. The All India Manufacturers' Organization, Industrial Assurance Building, Opp : Churchgate Station, Bombay.

NOTE.—*Those who have answered the questionnaire.

APPENDIX II.

Machine Tool Factories visited on behalf of the Board.

Name and address of the factory.	Name and designation of the officer.	Date Visited.
1. Atlas Works Ltd., 119, Rippon Street, Calcutta.	Mr. P. V. Rao, Cost Accounts Officer	22-1-47
2. Cooper Engineering Ltd., Satara Road.	Mr. R. N. Kapur, Technical Adviser	6-12-46 & 26-3-47
	Mr. P. V. Rao, Cost Accounts Officer	25-3-47
3. The India Machinery Co. Ltd., Dassnagar (Howrah).	Mr. P. V. Rao, Cost Accounts Officer	21-1-47
4. Indian Sewing Machine Mfg. Co. Ltd., Ferozepore Road, Lahore.	Mr. R. N. Kapur, Technical Adviser ..	9-10-46
5. Investa Machine Tools & Engineering Co. Ltd., Clerk Road, Pais Street, Bombay.	Mr. P. V. Rao, Cost Accounts Officer	17-3-47
	Mr. R. N. Kapur, Technical Advisor	17-3-47
6. The Mysore Kirloskar Ltd., Harihar (Mysore State).	Rai Sahib S. C. Aggarwal, Deputy Secretary.	24-12-46
	Mr. R. N. Kapur, Technical Adviser	24-12-46
	Mr. P. V. Rao, Cost Accounts Officer	24-12-46
7. Richardson & Cruddas, Byculla Iron Works, Bombay.	Dr. Rama Varma, Assistant Secretary	3-12-46
	Mr. R. N. Kapur, Techancial Adviser	3-12-46

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APPENDIX III.

List of firms or individuals to whom invitations to attend oral evidence were issued.

Producers :

1. The Mysore Kirloskars Ltd., Harihar (Mysore State).
2. The Climax Engineering Company, Gujranwala (Punjab).
3. Cooper Engineering Ltd., Satara Road, District Satara.
4. The India Machinery Co. Ltd., Dassnagar (Howrah).
5. Indian Sewing Machine Mfg. Co. Ltd., 210, Ferozepore Road, Lahore.
6. The Batala Engineering Co. Ltd, Batala (Punjab).
7. Investa Machine Tools & Engg. Co. Ltd., Clerk Road, Pais Street, Bombay.
8. Hind Machines Limited, 164, Jogendranath Mukherji Road, Salkia. Howrah.
9. Maya Engineering Works, 36-A, Russa Road, Calcutta.

Importers :

1. Alfred Herbert (India) Ltd., 13|3, Strand Road, Calcutta.
2. Associated British Machine Tool Makers Ltd., 6, Old Post Office Street, Calcutta.
3. Dodge & Seymour (India) Ltd., Laxmi Building, Ballard Estate, Bombay.
4. Eruch D. Engineer & Co., Apollo Street, Fort, Bombay.
5. Francis Klein & Company, 1, Royal Exchange, Calcutta.
6. Jayems Engineering Company, Warden House, Sir P. M. Road, Bombay.
7. Marshall Sons & Co. (India) Ltd., Marshall Building, Fort, Bombay.
8. Machine Tools (India) Ltd., Stephen House, Dalhousie Square, Calcutta.
9. William Jacks & Co. Ltd., 16, Clive Street, Calcutta.

Consumers :

1. The Ahmadi Shipyard, Gun Carriage Basin, Colaba, Bombay.
2. The B. E. S. & T. Co. Ltd., Electric House, Bombay.
3. Bombay Port Trust, Ballard Estate, Bombay.
4. Captain Superintendent, H. M. I. Dockyard, Bombay.
5. Director General of Ordnance Factories, Calcutta.
6. Jessop & Company Ltd., Dum Dum, Bengal.
7. Kaycee Industries Ltd., The Mall, Lahore.
8. Mazagon Dock Limited, Machinnon Mackenzie Building, Ballard Estate, Bombay.
9. The Metal Box Company of India Ltd., Calcutta.
10. India Electric Works, Calcutta.
11. N. W. Railway, Lahore.
12. G. I. P. Railway, Bombay.
13. B. B. & C. I. Railway, Bombay.
14. E. I. Railway, Calcutta.
15. B. N. Railway, Calcutta.

Associations :

1. The All India Manufacturers' Organization, Churchgate Street, Bombay.
2. Engineering Association of India, 102-A, Clive Street, Calcutta.
3. The Indian Machine Tool Manufacturers' Association, Ewart House, Bruce Street, Bombay.
4. Machine Tool Traders' Association of Great Britain, Post Box No. 2050, Calcutta.

Suppliers of Raw Materials :

1. The Tata Iron & Steel Co. Ltd., Bombay House. Bruce Street, Bombay.
2. The Steel Corporation of Bengal, Calcutta.
3. Mysore Iron and Steel Works, Bhadravati.
4. The SKF Ball Bearing Co. Ltd., Sir P. M. Road. Fort. Bombay.

Officials :

1. S. S. Iyengar, Development Officer (Tools), Industries and Supplies Department, New Delhi.

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APPENDIX IV.

List of persons who attended oral evidence on 9th and 10th April 1947.

PRODUCERS.	
Mr. B. M. Jambhekar	Representing The Mysore Kirloskar Ltd., Harihar.
Mr. S. L. Kirloskar	
Sir Dhanjishah B. Cooper	Representing Cooper Engineering Ltd. Satara Road, Satara.
Mr. N. C. Mookherjee	Representing The India Machinery Co., Ltd., 29, Strand Road, Calcutta.
Mr. M. N. Show	
Sir Ghulam Mohamad	
Mr. D. S. Mulla	Representing Investa Machine Tools & Engineering Co., Ltd. Bombay.
Mr. B. K. Nehru	
Mr. M. P. Vazifdar.	
Mr. Sheriff Choudhary	Representing The Batala Engineering Co. Ltd. Batala.
Mr. Bhim Sen Gupta	Representing Hind Machines Ltd., 7, Clive Street Calcutta.
Mr. C. H. Faraday	Representing Maya Engineering Works 36-A, Kussa Road, Calcutta.
IMPORTERS.	
Mr. C. O. Ayre	Representing Alfred Herbert (India) Ltd., Calcutta.
Mr. J. Hodkinson	Representing Associated British Machine Tool Makers Ltd. Calcutta. William Jacks & Co. Ltd. 16, Clive Street, Calcutta.
Mr. D. K. Inamdar	Representing Dodge & Seymour (India) Ltd., Bombay.
Mr. L. R. Elting	
Mr. K. S. Khushalani	Representing Jayems Engineering Co. Warden Road, Bombay.
Mr. C. W. Boulton	Representing Machine Tools (India) Ltd., Calcutta.
CONSUMERS.	
Mr. E. I. Ahmad Khan	Representing The Ahmadi Shipyard, Gun Carriage Basin, Colaba, Bombay.
Mr. B. W. Peel	Representing The Bombay Electric Supply & Tramways Co., Ltd. Bombay.
Mr. Zafar Ahmed	Representing Bombay Port Trust Ballard Estate, Bombay.
Mr. F. L. Round	Representing G. I. P. Railway, Bombay.
Mr. R. K. Innes	Representing Deputy Loco & Carriage Superintendent, B. B. & C. I. Rly, Bombay.
Mr. G. Falloon	Representing B. N. Railway, Calcutta.
ASSOCIATIONS.	
Mr. R. D. Vidyarthi	Representing Engineering Association of India, 102-A Clive Street, Calcutta.
Mr. Sankalchand G. Shah	Representing All India Manufacturers' Organization, Bombay.
Mr. J. Hodkinson	Representing Machine Tool Traders' Association of Great Britain, Calcutta.
Sir Dhanjishah B. Cooper	Representing The Indian Machine Tools Manufacturers, Bombay.
Mr. Gujjar,	
Mr. Bhimsen Gupta	
Mr. Sheriff Choudhary	
SUPPLIERS OF RAW MATERIALS.	
Mr. A. Rajagopalan	Representing The Tata Iron & Steel Co. Ltd., Bombay.
Mr. D. V. Krishnarao	Representing The Mysore Iron & Steel Works Bhadravati.
OFFICIALS.	
Mr. S. S. Iyengar	Development Officers (Tools) & Machine Tool Controller, New Delhi.
Commander P. C. Card	H. M. I. Dockyard, Bombay.
Mr. W. J. Mason	Directorate General of Ordnance Factories, Calcutta.

APPENDIX V.

Machine Tool Control Order.

New Delhi, the 15th February 1941.

No. 38.—In exercise of the powers conferred by sub-rule (2) of rule 81 of the Defence of India Rules, the Central Government is pleased to make the following order :

Machine Tool Control Order. 1941.

1. Short title, extent and commencement :—

(1) This Order may be called the Machine Tool Control Order, 1941.

(2) It extends to the whole of British India.

(3) It shall come into force on the first day of March 1941.

2. *Definitions.*—In this Order, unless there is something repugnant in the subject or context :—

(a) 'Machine Tool' includes any mechanical contrivance for cutting, forming, abrading, polishing, or otherwise working or treating wood or metal or plastic materials, such as Bakelite any standard equipment usually sold therewith and any machinery ancillary to the operation thereof ;

(b) 'Machine Tool Controller' means any officer appointed by the Central Government to exercise all or any of the powers of the Machine Tool Controller under this Order ;

(c) 'Scheduled Machine Tool' means a machine tool entered in the Schedule of this Order.

3. *Licensing of import, production, and sale of Scheduled Machine Tools* :—

(1) No person shall be engaged in—

(a) the import into British India from any place outside India ;

(b) the production ; or

(c) the sale ;

of any scheduled machine tool or any component part thereof except under and in accordance with a licence granted by the Machine Tool Controller.

(2) Licences for the production or the sale of Scheduled Machine Tools shall be in Form A appended to this order, and licences for the import of Scheduled Machine Tools shall be in such forms as the Machine Tool Controller may from time to time determine.

(3) The Machine Tool Controller may, for reasons to be recorded in writing, cancel any licence granted under this clause.

(4) No licence for import, production or sale of any machine tool shall be granted except under the condition that the machine intended to be sold, imported or produced in India shall be marked conspicuously and indelibly in English with the name of the firm manufacturing or selling the machine tool and with the serial or stock reference number of the machine tools produced or sold by that firm.

4. *Acquisition of Scheduled Machine Tools.*—No person shall acquire any scheduled machine tool from any person in India except under an authorisation by the Machine Tool Controller in form (B) as appended in this Order.

5. *Inspection of Premises.*—The Machine Tool Controller, or any officer authorised by him in writing in this behalf, may enter upon and inspect any premises in which machine tools are or are reasonably believed to be produced, kept for sale, sold or used.

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6. *Supply of Accounts and other information.*—Every person engaged in the import, production, sale, or use of machine tools shall :—

(a) keep such books, accounts, or other records relating to his undertakings as the Machine Tool Controller may direct ;

(b) produce to the Machine Tool Controller, or to any officer authorised by him in writing in this behalf, such books, accounts, or other records relating to his undertaking as may be demanded by the Machine Tool Controller or other officer as aforesaid ;

(c) furnish to the Machine Tool Controller such estimates, returns, and other information as the Machine Tool Controller may require ;

(d) permit the Machine Tool Controller, or any officer authorised by him in writing in this behalf, to enter upon any premises used for, or in connection with, his undertaking.

7. Any court trying a contravention of this Order may, without prejudice to any other sentence which it may pass direct that the machine tools in respect of which the Court is satisfied that the Order has been contravened shall be forfeited to His Majesty.

THE SCHEDULE.

All machine tools of the following types including any standard equipment or ancillary machinery usually supplied therewith :—

Section One :

Milling.
Diesinking
Engraving
Keyseating
Broaching
Oil Greeving
Splining
Profile Slotting
Marking.

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Section Two :

Metal Cutting
Cold Saws
Hack Saw Machines
Filing and Sawing
Band Saw Machines
Cutting off (Tool and Abrasive).

Section Three :

Testing Machines for Mechanical Workshop and Engineering Laboratory use.

Section Four :

Grinding (excluding small electrical bench and Portable grinders up to 10-in. wheels and Pneumatic Grinders).
Honing
Polishing
Lapping.

Section Five

Drilling
Pneumatic } other than portable electric or portable.

Section Six :

Capstan and Turret Lathes.

Section Seven :

Lathes—General.

Section Eight :

Furnaces, electrical, coal, coke, gas, or oil fired.

Section Nine :

Forging
Power Hammers
Drop Stamps
Riveting (other than portable hand riveters).

Section Ten :

Wire drawing and forming
Rolling Mills (other than jewellers).
Bar Reeling.
Bar Turning.

Section Eleven :

Thread forming, cutting, rolling or milling.

Section Twelve :

Moulding Machines and other machines for foundry us
Die Casting Machines.
Magnetic Separators.

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Section Thirteen :

Hydraulic Presses and other machinery for the production of plastic blocks and plastic mouldings (such as Bakelite and other cellulose products).

Section Fourteen :—

Sheet Metal Working Machinery (other than hand power types) including Shears, Punches, Presses, Benders, Brakes, Guillotines, Plate Straighteners and Rollers.

Section Fifteen :

Automatic Bar and Chucking Machines, single and multiple spindle.

Section Sixteen :

Gear Cutting.

Section Seventeen :

Shaping
Slotting.
Planing.

Section Eighteen :

Vertical Boring and Turning Mills.
Horizontal Boring
Jig Boring.

Section Nineteen :

Special and Standard machines particularly used in Railway Workshops, but not otherwise specified.

Section Twenty :

Oxygen Cutting
Oxy-acetylene Generating
Plant for welding and cutting
Electric Welding.

Section Twenty-one :

Wood-working machinery other than hand worked or small 'Homecraft' types.

Section Twenty-two :

Lathe Chucks.
Magnetic Chucks (Electric and Non-Electric)
Drill Chucks
Rotary Tables
Dividing Heads
Tool Post Grinders
Milling and Indexing attachments.
Machine Vices.

Section Twenty-three :

Synthetic Graphite and Amorphous Carbon Electrodes as used in Electric Furnaces for production of Iron, Steel, Ferro-Alloys and non-ferrous metals.

Synthetic Graphite and Amorphous Carbon Electrodes for use in Electrolytic processes.

Carbon Furnace Liner Blocks for use in Electric Furnaces for the production of Ferro-Alloys.

APPENDIX VI

List of Manufacturers of graded machines in India.

Province.	Firm and address.	Grade.	Annual capacity.	Types of Machines Tools manufactured.
Bengal ..	Britannia Engineering Co. Ltd., Titaghur.	I	336	Lathes, Grinding M/cs, Hacksaws.
	India Machinery Co., Ltd., Dassnagar, Howrah.	I	340	Lathes, Drilling M/cs., Shaping & Planing m/cs., Chucks.
	Jessops & Co. Ltd., 93, Clive Street, Calcutta.	I	24	Lathes.
	Maya Engineering Works, 36-A Russa Rd., Calcutta. ..	I	712	Drilling, Grinding, Presses, Furnaces.
	Atlas Works Ltd., 119, Ripon Street, Calcutta.	II	320	Lathes, Presses, Punching & Shearing.
	Heroes Engineering Works, 20, Paul Street, Calcutta.	II	452	Lathes, Drilling Chucks.
	Hind Machines, Ltd. 184, Jogendra Nath Mukherjee Road, Howrah.	II	570	Drilling, Milling Bandsaws, Circular Saws.
	S. L. Dutt & Co., 42/1/2, Muraripukur Calcutta.	III	156	Lathes, Drilling.
Bombay ..	Cooper Engineering Co. Ltd., Satara Road, Satara.	I	279	Lathes, Drilling Shaping.
	Investa Machine Tool & Engineering Co. Ltd. Clerk Road, Pais Street, Bombay.	I	372	Lathes, Drilling Punching & Shearing.
	Richardson & Cruddas, Byculla Iron Works, Bombay.	I	18	Planing.
	G. G. Dandekar M/cs Works, Bhiwandi.	II	120	Grinding, Circular saws.
	New Standard Engineering Co. Ltd., 222, Bellasis Road, Bombay 8.	III ..	84	Drilling, Rolling.
Mysore State.	Mysore Kirloskar Ltd. Harihar	I	876	Lathes, Drilling, Presses, Planing Shaping, Hacksaws.
Punjab ...	Batala Engineering Co., Ltd., Batala.	I	308	Lathes, Drilling Planing.
	Ganga Ram Hari Ram, Jail Road, Lahore.	I	200	Lathes.
	Indian Sewing M/c. Mfg. Co. Ltd. Lahore.	I	1,500	Chucks.
	Climax Engineering Co., Gujranwala.	I	1,000	Chucks.
	Perfect Machinery Works 7, Brandreth Road, Lahore.	II	72	Bandsaws.
	Noor Engineering Works, 92, Railway Road, Lahore.	II	4	Lathes.
	Unique Engineering Works, Gujranwala.	III	55	Bandsaws.
	Victor Crane & Co. Ltd., Sialkot City.	III	105	Bandsaws.

APPENDIX VII.

Statistics of Licences issued by the M.T.C. for the import of machine tools.

Serial No.	Classifications of Machine tools	1941 Nov-Dec.		1942.		1945 Mar-Dec.		1946.	
		U.K.	U.S.A.	U.K.	U.S.A.	U. K.	U.S.A.	U. K.	U.S.A.
1	Centre Lathes ..	50	374	109	..	404	70	708	26
2	Capstan & Turret Lathes.	20	7	38	..	141	2	437	12
3	Milling Machines ..	20	16	13	..	227	10	586	20
4	Drilling Machines ..	27	51	27	..	522	117	861	20
5	Grinding Machines ..	4	21	20	..	325	33	875	62
6	Screwing Machines ..	24	..	2	..	44	25	193	2
7	Welding & Cutting Machines.	18	128	378	..	390	30	931	182
8	Wood Working Machines.	2	3	9	..	124	23	307	103
9	Furnaces ..	22	4	19	..	92	1	237	13
10	Automatics ..	3	..	1	..	10	1	22	..
11	Boring Machines ..	8	..	8	..	50	6	30	2
12	Testing Machines ..	2	..	5	..	36	1	84	4
13	Forging Machines	..	..	5	..	33	3	9	22
14	Sheet Metal Working Machines.	92	195	113	..	436	27	549	83
15	Gear cutting and Grinding Machines.	3	3	4	..	27	1	70	18
16	Metal Sawing Machines	6	..	7	..	131	12	28	9
17	Planing, Shaping and Slotting Machines.	21	16	14	..	131	9	299	53
18	Rolling Mills & Wire Drawing & Forming Machines.	77	..	3	..	24	7	59	..
19	Foundry Machines ..	7	4	148	..	42	1	65	12
20	Other Machines ..	1	6	..	..	305	6	31	..
		407	828	923	..	3,494	385	6,381	643
21	Ind. 4 Jaw Lathe Chucks.	16	41	748	..	1,225	..	2,681	24
22	Self Centering 3 Jaw Lathe Chucks.	..	2	358	..	1,245	..	4,467	17
23	Drill Chucks ..	..	..	141	..	486	12	1,770	1,268
	Total ..	16	43	1,247	..	2,956	12	8,918	1,309
		407	828	923	..	3,494	385	6,381	643
		16	43	1,247	..	2,956	12	8,918	1,309
	GRAND GOTAL ..	423	871	2,170	..	6,450	397	15,299	1,952

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APPENDIX VIII.

Directorate General of munitions production—Tools Division (Machine Tool Control).

Classification of Machine Tool Order by Indentor and Type of Machine from 1-1-43 upto and including week ended 5-6-1945.

	Centre Lathes	Capstan and Turret Lathes 2	Milling Machines 3	Drilling Machines 4	Grinding Machines 5	Screwing Machines 6	Welding and Cutting Machines 7	Wood Working Machines 8	Furnaces 9	Automatics 10	Boring Machines 11	Testing Machines 12	Forging Machines 13	Sheet Metal Working Machines 14	Gear Cutting & Grinding Machines 15	Metal Sewing Machines 16	Planing, Shaping and Slotting Machines. 17	Rolling Mills & Wire Drawing & Forming Machines. 18	Foundary Machines 19	Others 20	Total 21
(A) Army, Navy, Airforce.	286	50	42	566	329	50	144	613	76	..	18	15	472	147	3	660	132	6	4	245	3,858
(B) Munitions Production.	566	114	88	270	236	23	107	163	58	7	9	21	316	434	2	37	75	5	3	135	2,669
(C) Aircraft Manufacture and Repairs.	110	48	42	84	132	2	17	64	15	2	7	18	9	49	..	11	26	4	9	15	664
(D) Shipbuilding & Repairs and Port Authorities.	225	10	15	75	86	14	110	76	6	..	17	1	30	41	3	10	40	3	1	34	797
(E) Transport ..	549	195	66	278	144	24	193	64	25	4	45	8	51	77	5	53	121	..	9	65	1,976
(F) Technical Training Centre.	112	3	13	61	56	7	28	13	2	..	2	10	1	14	..	31	45	..	..	6	404
(G) Communication Services.	45	132	17	60	21	30	5	12	9	..	..	..	13	12	..	6	6	..	9	5	382
(H) Miscellaneous Govt. Departments.	85	14	13	70	30	7	34	21	21	1	1	4	2	55	..	12	11	21	1	16	419
(I) Utility Services.	56	2	6	20	12	1	13	1	1	..	1	..	2	7	..	2	6	..	1	1	131
(J) Iron & Steel Works and Rolling Mills.	186	6	15	82	49	17	53	21	11	6	14	15	18	61	4	29	76	2	2	34	701

(K) Non-Ferrous Industry.	90	1	3	24	12	2	21	8	14	..	..	..	..	13	1	3	11	4	..	2	209
(L) Bolts, Nuts, Rivets & Screws.	48	..	9	12	17	42	3	..	2	..	..	2	13	2	..	4	6	1	..	13	174
(M) Heavy Engineering & Constructional Industry.	173	13	6	67	34	9	84	27	3	..	3	..	3	39	..	26	36	2	..	12	537
(N) Food .	199	5	5	67	11	2	22	55	7	..	2	..	..	20	..	14	51	2	2	10	475
(O) Chemicals ..	150	5	7	46	21	2	62	52	10	..	7	1	6	28	..	19	46	..	..	12	465
(P) Textile Industry	356	35	18	100	21	6	49	53	13	2	2	..	3	36	2	19	96	..	..	9	820
(Q) Electrical Industry.	248	41	16	95	53	6	37	20	6	..	..	5	11	61	3	20	47	4	1	23	697
(R) Machine Tool & small Tool Mfr.	523	93	63	189	121	23	55	36	23	1	18	21	16	91	8	50	146	10	17	45	1,549
(S) Hand tools, Hardware and Agriculture Industries.	415	14	12	152	54	17	34	51	6	2	1	7	18	50	6	34	116	7	2	33	1,031
(T) Scientific & Surgical Instruments.	128	9	5	35	18	..	7	5	3	..	..	..	3	8	..	5	20	..	..	14	260
(U) Coal, Mica & Oil	75	2	2	30	24	4	21	20	3	..	1	..	..	2	..	6	21	..	2	45	258
(V) Timber & saw Mills.	87	..	..	35	10	13	8	614	..	..	..	..	1	12	1	6	19	1	1	9	817
(W) Metal Boxes, Containers, Drums and Canning.	100	4	2	60	24	13	27	18	1	..	..	..	5	160	..	18	45	4	2	23	506
(X) Other Civil Industries.	501	26	21	148	70	6	45	132	10	1	4	2	5	117	4	25	101	..	3	23	1,244
(Y) Under allocation	198	62	101	270	138	79	84	24	8	3	13	9	56	216	4	47	34	2	31	33	1,412
Total ..	5,511	884	586	2,896	1,723	399	1,253	2,163	333	29	165	139	1,054	1,752	48	1,147	1,333	78	100	862	22,455

NOTES—

1. These statistics do not include (*i*) Machine Tools ordered for ordnance Factory Projects and (*ii*) Machine Tools ordered for the Army, Air Force, The Directorate General, Aircraft, and Oil Companies after August 1943.
2. These statistics include Machine Tools ordered against which Machine Tools imported into India prior to 1-1-43 have been supplied.

APPENDIX IX

Production figures of indigenous ***machine tools.***

	Nos.	Value. Rs.		Nos.	Value. Rs.
Graded Machines—					
Grade I—					
1942	179	5,21,210			
1943	1045	37,96,494			
1944	1355	53,24,638			
1945	2826	79,34,984			
1946	3578	71,93,550			
Total	8983	2,47,70,876	Average	1796	49,54,175
Grade II—					
1942	17	63,750			
1943	505	23,13,040			
1944	487	14,30,490			
1945	433	17,94,050			
1946	380	11,55,800			
Total	1822	67,57,130	Average	364	13,51,426
Grade III—					
1942	77	23,100			
1943	163	2,49,500			
1944	328	11,24,400			
1945	440	14,37,155			
1946	163	29,89,560			
Total	1171	58,23,715	Average	234	11,64,743
		Total		2394	74,70,344
Ungraded Machines—					
1943	43	16,200			
1944	2885	24,60,120			
1945	7277	48,33,025			
1946	4689	59,75,375			
Total	14894	1,32,84,720	Average	**3723**	**33,21,180**
Grand Total of Graded And Ungraded Machine Tools				6117	**1,07,91,524**

APPENDIX X.

Comparative study of cost of imported and indigenous machine tools.

Size.	Name of indigenous manufacturers.	Fair Selling Price (Indigenous)	Comparative Imported Size.	Importers' name.	Landed cost inclusive of duty.	Selling price (Imported).
		Rs. A. P.			Rs. A. P.	Rs. A. P.
A. Lathe	..		6'×13" Quick change gear Lathe the Under motor drive.	Machine Tools (India) Ltd., Calcutta.	3,360 10 0	5,147 8 0
1. Harihar No. 2 Lathe 6'×6½" (Cone Pulley Type).	Mysore Kirloskar Ltd., Harihar.	1,457 0 0	6'×6½" (Lathe Cone Pulley) 6'×6"	Machine Tools (India) Ltd., Calcutta.	1,319 9 0	1,759 7 0
				Information supplied by Collector of Customs, Madras.	..	4,705 0 0
2. Alfred Herbert Lathe 6'×6¼" (Cone Pulley Type)	Investa Machine Tools & Engineering Co. Ltd., Bombay.	5,127 0 0	5'×10"×6¼" F.M.H.F.S.Q.	Dodge & Seymore (India) Ltd., Bombay.	2,837 0 0	3,121 0 0
3. Alfred Herbert Lathe 6'×8"	Cooper Engineering Ltd., Satara Road.	5,693 0 0	6'×7½" Lathe (Cone Pulley).	Machine Tools (India) Ltd., Calcutta.	1,470 1 0	1,960 1 0
			6'×16" Quick change gear lathe Under motor drive.	Do.	5,370 0 0	7,160 0 0
4. Shimoga No. 2 Lathe 8'×9¼" (Cone Pulley Type).	Mysore Kirloskar Ltd., Harihar.	2,609 0 0	8'×9"	Machine Tools (India) Ltd., Calcutta.	3,270 1 0	4,360 1 0
			8'×9¼" ..	Information supplied by Collector of Customs, Madras.	..	6,930 0 0
Drilling Machine Delhi 20" Drilling Machine (1¼")	Mysore Kirloskar Ltd., Harihar.	1,538 0 0	20"×1¼" Drilling Machines Vertical type.	Machine Tools (India) Ltd., Calcutta.	540 0 0	720 0 0
C. Shaping Machine 12"	Mysore Kirloskar Ltd., Harihar.	2,140 0 0	13"	Machine Tools (India) Ltd., Calcutta.	1,051 0 0	1,401 5 0
12"	Cooper Engineering Ltd., Satara Road.	2,069 0 0	12"	Information supplied by Collector of Customs, Madras.	..	6,340 0 0
24"	Do.	3,745 0 0	20"	Machine Tools (India) Ltd., Calcutta.	1,530 0 0	2,040 0 0
			20" Cone Pulley Type).	Information supplied by the Collector of Customs, Madras.	..	9,625 0 0
D. Power Presses— Zebra D-14T (Rigid Type) ..	Mysore Kirloskar Ltd., Harihar.	1,172 0 0	14 Ton (Belt driven American).	Machine Tools (India) Ltd. Calcutta.	1,087 9 0	1,450 0 0
			14 Ton	Information supplied by Collector of Customs, Madras.	..	6,255 0 0

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